A wise mother and good books enabled me to succeed in life. She was very poor, but never too poor to buy books for her children. It is a mean sort of economy that starves the mind to feed the body.—*Henry Clay.*

The Mother's Creed

I Believe, with the gardener, that the youngest plants should have the tenderest care; that the habits of early youth should be so moulded as to develop fixed traits of good character in the adult. ¶I believe what one wills to be, one can be; "that education lays the foundation, but that self-education erects the building;" that the mind can only possess that which it does. ¶I believe that obstacles and reverses are but quality-testing stepping-stones to success; that the room for improvement is the largest room in the world. ¶I believe that within the breast of every child is an instinctive desire to do good; to grow; to learn; to work; to love; to achieve. ¶I believe in home encouragement; that a home without good, useful books is like a home without windows; that where there are children should be found the treasure thoughts of the greatest men and women of all ages which ever beckon on and on, inspiring to higher ideals and nobler ambitions. ¶I believe that the mind can only be rightly formed when it is rightly informed; that opportunity ever knocks at the door of those who are rightly equipped to fight life's battles; that the power to think grows by exercise. ¶I believe in the pleasure of self-sacrifice, the price paid by hundreds of mothers of world-renowned men. ¶I believe in the education that stimulates thought; develops self-reliance and leads to a delight in whatever is fair in nature, in whatever is true and beautiful in literature and art.

—*J. H. H.*

THE PRACTICAL HOME AND SCHOOL EDUCATOR

CONTAINING COURSES OF READING AND STUDY

WITH OUTLINES AND QUESTIONS

ARRANGED TO ACCOMPANY

THE NEW PRACTICAL REFERENCE LIBRARY

AN INVALUABLE AID TO THE STUDENT

VOLUME VI

THE DUM BROTHERS
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COLUMBUS, OHIO

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Let us cherish our public schools as the looms, and our teachers as the weavers who weave the wondrous destiny for the nations.—*John Fiske.*

The Teacher's Creed

"I BELIEVE in boys and girls, the men and women of a great to-morrow; that whatsoever the boy soweth the man shall reap. I believe in the curse of ignorance; in the efficacy of schools; in the dignity of teaching; and in the joy of serving others. I believe in wisdom as revealed in human lives as well as in the pages of the printed book, in lessons taught, not so much by precept as by example; in ability to work with the hands as well as to think with the head; in everything that makes life large and lovely. I believe in beauty in the schoolroom, in the home, in daily life and out of doors. I believe in laughter; in love; in faith; in all ideals and distant hopes that lure us on. I believe that every hour of every day we receive a just reward for all we are and all we do. I believe in the present and its opportunities; in the future and its promises; and in the divine joy of living."

Edwin Grover.

THE WORK OF THE TEACHER.

To help the young soul; to add energy, inspire hope, and blow the coals into a useful flame; to redeem defeat by a new thought, by firm action; that is not easy, that is the work of divine men.

Emerson.

Introduction

The carefully selected and classified outlines and questions presented in this Educator and the thorough treatment given every subject in The New Practical Reference Library supplies the ambitious person with the necessary material by which he can fully develop all practical subjects. This Library at once becomes a home university, and a practical knowledge will result from its use which will prove even more effective in the mastery of the daily problems of life than will ordinarily be obtained from any other source.

To the busy business man, whose time is his capital, the facility with which reference can be made and the interesting treatment of practical subjects will enable and encourage him to make the reference and acquire the information when ordinarily he would not do so. To the club woman wanting concise, accurate, up-to-date information and not desiring to burden herself with research and tiresome detail, we supply the material that will enable her to present her part in a charming and acceptable way. To the teacher this Library will prove a relief, supplying the supplementary material necessary to create an interest in every department of her work. The student making a careful study of The New Practical will understand well at least the following subjects and not follow blindly the narrow confines of the text-book as is too often the custom.

AGRICULTURE.

Our course in Agriculture is designed to develop a love for rural life and to show to the boys and girls the possibilities of this most important occupation. Too many have in mind that anyone can be a farmer, little realizing that it is a subject as difficult of mastery as the arts and sciences. True, anyone can be a plodder and the fact that many have so regarded the farmer has resulted in a distaste for this noble work and occasioned a trend to city life.

ORTHOGRAPHY.

An able writer has said: "Nothing in written composition makes so unfavorable an impression or is so inexcusable as bad spelling." Correct spelling is an accomplishment which can be acquired by any student, but must be gained while young; and our very helpful exercises should awaken an interest in this subject which will prove an incentive in its mastery.

LANGUAGE.

One of the most gifted qualifications is the correct use of English, and to have the pupil become so thoroughly proficient in this subject that he will use correct English merely from habit is of chief importance. The many exercises which we have given and the excellent editorial work devoted to The New Practical Reference Library equip one for the acquirement of this important subject.

ARITHMETIC.

One of the most necessary and practical subjects taught in the schools is arithmetic. It has been our aim to eliminate much of the useless matter found in the text and to drill thoroughly on the fundamental operations, and in that way we prepare the student for a thorough understanding of this all important subject.

If the pupil will make a thorough study of the work outlined, we feel sure that it will result in the mastery of such arithmetical knowledge as is necessary for the ordinary affairs of life.

GEOGRAPHY.

All work in this subject begins with the home. We have given you exhaustive outlines on your school district, township and county, and we have taken up various states and cities, not only giving you outlines, but supplying in The New Practical Reference Library the necessary information for a thorough study of these subjects. Our system of outlines will help you to make a systematic study of this information and the pen sketches will enable the eye to assist the memory in retaining the facts. The pupil making a study of geography, in connection with this help, should acquire not only a thorough knowledge of our own country but an understanding knowledge of the geography of the world.

READING.

Reading being the basis of all study, we have endeavored to supply material that will create an interest in this subject, and by following out the suggestions the pupil will acquire the ability to read intelligently the texts, the newspapers and the books necessary for the acquirement of knowledge. He will not only read in an understanding way but be able to convey such information to others when reading aloud.

SCIENCE.

Many subjects in science are quite fully developed, all of them sufficiently to understand the ordinary phenomena connected with life and the world about us. A very thorough study is given on Physiology and careful attention given to this course will enable one to understand the structure, nourishment and support of the human body and the hygienic rules necessary for its care.

HISTORY.

No other work is so unique in the presentation of the subject of history. The colored charts and pen sketch work here supplied will enable many pupils to become familiar with the history of the world and of our own country who have heretofore considered this subject difficult and uninteresting. Our treatment of Civics is such as will enable anyone to understand the workings of our government and we believe a careful study of these two subjects will result in better citizenship and prove very beneficial to our boys and girls.

LITERATURE.

In the Educator we give you comprehensive outlines on English and American literature, on the drama, on Shakespeare, and supply you with gems of literature. These model outlines will serve you in developing any department of this subject from the information found in The New Practical Reference Library. The historical and systematic arrangement here given will enable anyone to obtain a comprehensive view of this entire subject.

GENERAL.

We have merely called attention to a few of the many essential subjects which enter into a practical education. In addition to the subjects mentioned above, you will find careful treatment of many others such as Drawing, Handiwork, Music, Mythology, Education, Religion, Politics, Business, etc. Every student knows how important it is to have an abundance of supplementary material outside of the regular text, and how much labor it costs to collect it. This Library will thus relieve the overworked teacher and inspire the ambitious student, enabling them to do more effective work at a smaller outlay of effort.

Habit is a cable of which we weave a strand each day, and bye and bye it becomes so strong nothing can break it. —*Mann.*

THE PRACTICAL HOME AND SCHOOL EDUCATOR

Its Object and Use

A noted educator has said that a student is half made as soon as he seeks knowledge for its own sake. The Practical Home and School Educator aims to create such a desire and should become indispensable to every owner or user of The New Practical Reference Library. The chief claim to value of the Educator will lie in its ability to arouse the interest, systematize study, stimulate a love for knowledge-seeking, develop the observation, broaden the intellect, and add to the storehouse of useful and necessary information, on the part of every student, young or old.

The Outlines

To the teacher and pupil the many excellent outlines, with the thousands of interesting, practical questions, should appeal very forcefully. They indicate clearly how a subject or topic should be discussed and studied. Teachers and pupils daily feel the need of outlining their work systematically and clearly to obtain the most effective results. Whether it be in the preparation of the simplest composition on a nature study subject, or the writing of an essay or theme, the pupil should have his outline to follow. The outline bears the same relation to a teacher's or pupil's work as the framework does to the building, the steel girders to a skyscraper.

In every city a course of study has been arranged for the various grades and departments of work and is followed by the teaching staff. In the preparation of the Educator the editors have made frequent reference to, and use of, these reliable guides, and it is believed it will be found in thorough sympathy and accord with the needs of teachers and pupils. The Educator contains model outlines on practically every department of knowledge, from the primary grades throughout the high school and normal course. These alone furnish the ambitious teacher ample suggestive material for the pursuit of any line of study during idle hours or permit successful review work. From these outlines the teacher will find it an easy and pleasant task to outline other subjects and follow them with interesting and instructive questions, *questions that entertain while they instruct.*

It will be noticed that all the main divisions of an outline will be found treated in The New Practical Reference Library. In the outline on Agriculture, for instance, there are many subdivisions, such as Soil, Plants, etc., each of which is fully and interestingly treated and in turn can be outlined.

Besides, the reader is constantly referred to lists of correlated subjects, permitting extended study and research.

The Questions

The feature that will appeal to parents and teachers alike is the list of interesting questions that follows the outlines. These afford the student, young or old, a wide field for pleasant and profitable study. It must be apparent to every parent and teacher that by the use of this feature in connection with The New Practical Reference Library many an otherwise long, rainy day or winter evening can be devoted to excellent use. Home study clubs can be organized. Father and mother will find an hour spent with the children in such study invaluable to themselves. The habit acquired of devoting a few minutes each day in this manner must recommend itself to all who value time and know what it means to be well-informed.

It will be noticed that many of the questions relate to the boy's immediate surroundings—the home, the playground, the neighborhood, his city and county. This leads to a keener observation, greater alertness, and increases the interest. For home study work begin with subjects relating to the breakfast table, such as Coffee, Sugar, Salt, Orange, Tea, etc., and note the immediate interest aroused and what an earnest effort is made to procure the information called for. Many of the questions will arouse one's curiosity; curiosity will in turn arouse one's interest, and interest leads to investigation and study. These habits in turn lead to the acquirement of the most practical education.

In looking up the information sought from these questions in The New Practical Reference Library, the student should turn to the subject most directly alluded to in the question. Ninety-nine per cent of the questions are based on information found in the Library. Their value lies in the fact that they must be looked up. This soon develops the habit of research which leads to a love for knowledge. Once acquired this habit becomes a fixture for life. A few questions are asked throughout the Educator that cause one to resort to pencil and paper for solution, such as, "How many Rhode Islands can be carved from Texas?" "What would be the population of California if as thickly settled as Massachusetts?" In each case the information needed as a basis for solution will be found in the subject referred to and should be looked up. The comparison so made makes a vivid and lasting impression and will lead to further study and research.*

It is sincerely hoped the teacher, the parent, and the pupil will find The Practical Home and School Educator a source of daily encouragement, interest and value.

* Explanatory.—It should be remembered the outlines and questions are largely intended to serve as examples. The student should find it exceedingly helpful to prepare in some such manner hundreds of other subjects.—Editor.

The mind that is not awake and alive will find a library a barren wilderness.
—*Theodore Parker.*

The best part of every man's education
is that which he gives to himself.
—*Scott.*

To the Ambitious Young Man and Woman

The ambitious young man and woman denied the advantages of a broad education or desirous of adding to their fund of useful information will find THE NEW PRACTICAL REFERENCE LIBRARY and THE PRACTICAL HOME AND SCHOOL EDUCATOR a veritable university placed at their disposal. With the helpful stimulus and effective, intelligent plan of study furnished by the EDUCATOR a field for study is opened, as wide as human knowledge and achievement. The best thoughts of all the ages, the wisdom gathered from a thousand geniuses are placed at their disposal. An hour a day of such study will make an ignorant man well educated in the course of two years. It gives him a capital on which he will draw dividends and interest throughout life. Today, more than ever before, it is the man who knows, the one who is broadly and correctly informed, who is ready to grasp the opportunities as they come. Self-help is at the basis of all achievement.

"Education," Bishop Spalding says, "lays the foundation; self-education erects the building." Not to grow is to retrograde. No one is so great in business or skilled in the arts that he can afford not to improve himself. It is said that the late Marshall Field made it a rule to keep no employee who did not merit promotion within six months after beginning work. The greatest students, and not the men of greatest talent, dominate the world's affairs. Life is a battle. The victors are those who not only advance to meet every opportunity, but daily add a fresh fund of practical knowledge, knowing that knowledge is not only power, but property.

That accomplished philologist, the late Lord Strangford, could find ample amusement for an hour's delay at a railway station in tracing out the etymology of the names in Bradshaw.

Let me advise you to make a variety in your modes of teaching. If you have been teaching in one way that you think is best, take another way tomorrow. The new way will be a revelation to some of your dull pupils with whom you have been unable to do anything.

—*Francis W. Parker.*

To the Teacher

A school without interest is a burying place for many ambitions. Here are killed the impulses to grow, to know, to study and observe, to do and to acquire. The caretaker of such a school is a teacher who has ceased to grow and so can only weary where she should inspire and stimulate. Such a teacher, either from lack of material or inclination, invariably follows a narrow, beaten pathway, the walls of which are lined with the lifeless pages of text-books. True teachers must feel that they are educating themselves as well as their pupils. They must enter into the work with enthusiasm and earnestness. They should kindle in the heart of every pupil a love for study. They should endeavor to add to every well-known fact some new material. In stimulating their pupils to think, to investigate and to observe, they should themselves be searchers and observers. Such a teacher gradually leads the pupil to educate himself, by developing the powers of his mind through his interest, and so renders her aid unnecessary.

To such teachers, THE PRACTICAL HOME AND SCHOOL EDUCATOR and THE NEW PRACTICAL REFERENCE LIBRARY cannot fail to appeal. In these volumes, which are a product of the leading educators of the country, the teacher will find helpful supplementary material, timely suggestions, and an inexhaustible field for self-improvement. The splendid outlines and excellent questions will prove invaluable as a stimulus for the pupil's study. Lessons are made bright and interesting by new material. Subjects are assigned to be looked up, and each teems with life and interest. Contrast this for a moment with the old method, which was dependent upon memory and rote work. Schaeffer, in his "Thinking and Learning to Think," says: "From the day the children became interested in their lessons, the rod was no longer required. Instead of crying because they must go to school, they now cry because they cannot go."

The thousands of questions covering all grades of school work can be used by progressive teachers to awaken the liveliest interest on the part of both pupil and parent. When the educational sense is aroused, it is not difficult to get good results. Then discipline comes as a matter of course. Where interest is lacking, success is lacking. You cannot fill a corked jug by pouring water on it. You cannot teach when the mind is still asleep. Promotion always follows preparation. Teachers do not progress because of luck or pull, but generally because of good results caused by ceaseless effort. Cream always rises to the top.

We sincerely believe that by the use of THE PRACTICAL HOME AND SCHOOL EDUCATOR and THE NEW PRACTICAL REFERENCE LIBRARY teachers will be able to systematize their work better, save their energy, economize their time, and make every lesson more interesting, every day's work more effective.

It is easier for the growing boy to form a hundred good habits than to reform one bad one as an adult.

To Parents

You often have wondered why some boys take such a delight in their school work, while others manifest so little interest for it.

Let us visit the homes of two such boys of the same age in quest for a reason. In the first home we find a boy with an active and inquisitive mind. He asks scores of questions, a natural result of an active, growing, mind, some the result of his day's school work, some prompted by his father's and mother's discussions or reading, others the result of his day's observations in the home or on his way to and from school, still others the result of his own thinking and discussions with his playfellows. We admire his interest and alertness. We say to ourselves that to begin right is to continue right. Instinctively we think of the successful professional and business men whom we know as having been just such boys, retaining all these years the habits and traits of early boyhood. Inquiry reveals the fact that this boy has been blessed with teachers who helped him most by leading him to help himself. They have stimulated him to think, to observe, to investigate subjects and questions; in short, to do for himself. We also learn what is far more important—that he has constantly been encouraged along these lines of study by an interested father and mother, who provided him with the means for self-help and improvement.

In the second home we find a boy who manifests no interest in his school work or studies. He does not observe; he does not ask questions; he is not wide-awake; he does not think or reason; he has a mind, but it is not hungry for knowledge; he prefers idleness to activity. Again we think of many idlers and no-accounts, of the shiftless and dependent, and picture we see them as in boyhood in the boy before us. Inquiry reveals the fact that his teachers have stimulated him to think, to observe, and do for himself, but he fails to respond because his first efforts along this line have met with no encouragement from father and mother, who felt their whole duty was done when he was sent off to school, forgetting that he needs their help, their encouragement, above all, their interest in his work. Again, father and mother cannot help him, because they do not understand his work or are too busy to give it their time. He finds no helpful working tools on his study table. The question that he was assigned to look up yesterday he cannot answer on his return to school today. He feels the odds are too great, the humiliation too much. He becomes discouraged, soon he loses heart and all interest, and simply drifts. The teacher's best efforts will fail unless the home influence is right.

In the case of each boy's early years, asking questions was perfectly natural. Asking questions should be a source of pleasure and satisfaction, a lack of them a source of regret and grave concern in every home where there are boys and girls.

The Practical Home and School Educator has been prepared to enable

parents and teachers of the first boy to hold and develop his interest; to enable the parents and teachers of the second boy to encourage and awaken and stimulate in him a desire to learn and achieve. It furnishes a field of natural research and delightful study, broader than that given in any college or university.

In the preparation of THE NEW PRACTICAL REFERENCE LIBRARY, the educators have aimed to give information in simple, concise, and interesting manner on practically every subject that will come up in connection with a boy's entire school life, and, best of all, to give it in such a way that he can find it by himself and for himself. Intelligent parents and teachers have long felt the need of such a work.

The thousands of questions and helpful outlines cannot fail to interest every one. A studied effort has been made to ask such questions as will lead to observation and investigation in the boy's own home and immediate neighborhood. Parents using the EDUCATOR in connection with THE NEW PRACTICAL REFERENCE LIBRARY will find much of help and interest to themselves. We never grow too old to learn. No one is too old or too young, too wise or too ignorant, to gain good from its pages. After all, the habit, early acquired, of looking up subjects as they come to one's mind, is the most valuable part of any boy's or girl's education. With this habit securely fixed, school houses and teachers could be dispensed with and yet the education would go on and on as did Lincoln's.

Hawthorne in the parlor of a country inn on a rainy day could find mental nutriment in an old directory.

Those who think must govern those who toil.—*Goldsmith.*

How to Study

The spirit of self-help is the root of all genuine growth in the individual. The opportunities for study which the quiet of the home offers are unequaled. The way the leisure hours at home have been used has determined the success or failure of legions of men and women. When one has learned *how* to study he has obtained the best part of his education; for he has acquired the power which will enable him to master any subject, provided he possesses the necessary patience and perseverance. The men who are considered great geniuses, and who have moved the world, have been able to accomplish great things because they were able to attend to subjects longer and more systematically than their fellows.

One's education consists of two parts—what one learns by oneself and what one learns from others. Both parts are valuable, but with most people the second is by far the more extensive. What we learn from others is obtained very largely through the reading and study of books.

Books contain the stored-up wisdom of the past. Through them we learn of the experiences—the successes and the failures—of previous generations, and profit by these experiences.

Study is systematic reading for the purpose of gaining knowledge. This fact should be kept in mind by parents and teachers.

The following directions for study are given in the hope that they may save some waste of effort and be found generally helpful:

1. Study requires attention. One cannot gain knowledge through reading unless his mind is fixed upon the subject. A boy cannot solve a problem in arithmetic while thinking about a game of marbles, nor can a girl learn a lesson in history while her mind is upon a party she expects to attend in the evening.

2. Interest is the key of attention. Why does the boy think of the game of marbles instead of the problem, and the girl give her attention to the coming party instead of the history? Simply because the marbles and the party are more interesting subjects. Were the arithmetic and the history made as attractive, the attention would be given to them as readily as to the marbles and the party. *Interest* is the satisfaction that we derive from the study of a subject or the appeal which the subject makes to us.

3. Understanding is necessary to interest. A subject which we do not understand does not appeal to us. All subjects should be so presented to children that they can understand them. The language should be simple and the thought and illustration should be clear. When parents and teachers present subjects to children in this way, they will have little trouble in securing interest in them. Care should be taken that the meaning of all words used be understood and that all references to related subjects be cleared up. This means that children should be taught as early as possible the use of works of reference.

4. Study to remember. Memory links the past with the present. It is that mental power that enables us to join the lesson of yesterday to that of today.

It develops early in life and should receive careful cultivation. But we should be sure that children understand what they memorize. Unless this precaution is taken, they will commit to memory words that have no meaning.

5. Study systematically. A systematic arrangement of a subject under divisions and subdivisions assists in the understanding of the subject and also aids the memory. Suppose you wish to learn about COAL. You would want to know (1) what it is, (2) how it is formed, (3) the different kinds or varieties of coal, (4) where it is found, (5) the leading countries in its production, (6) its principal uses, (7) how long it has been used, and when it was discovered in the United States. The above outline gives an idea of the sort of plan that should be followed in studying a subject, also how the leading articles in the NEW REFERENCE LIBRARY are arranged.

6. Study to apply your knowledge. The only test of knowledge is ability to use it. A boy may commit to memory all the rules in the arithmetic, but if he cannot reckon the interest on a note, he does not *know* the rule for finding interest, however glibly he may repeat it.

The true university of these days is a collection of books.

—*Carlyle.*

Agriculture

Agriculture is the oldest of occupations and the basis of all other arts. All wealth comes originally from the soil and thus the farmer becomes the backbone of civilization.

The great demand for American agricultural products by the nations of Europe has led to wonderful development in every department, and to the intelligent farmer who knows how to produce the best results without exhaustive labor, farm life is the healthiest and most invigorating in the world.

THE NEW PRACTICAL REFERENCE LIBRARY is rich in information along every line of agricultural development. The general outline, followed by the outlines and questions on IRRIGATION, CORN, MILK, FORESTRY, etc., are merely suggestive of the treatment of the hundreds of undeveloped subjects.

OUTLINE.

I. EARLY HISTORY.

II. PROGRESS.

III. AGRICULTURAL MACHINERY.

IV. DIVISION OF LABOR.
   1. Dairying.
   2. Stock Raising.
   3. Horticulture.
   4. Cereal Crops.

V. EDUCATION.
   1. Agricultural College.
      a. Who first recommended?
      b. When first established?
      c. What grants and appropriations?
      d. How universal now?
      e. What kindred subjects?
      f. How locally adapted?
   2. Agricultural Experiment-Stations.
      a. Origin.
      b. Location.

c. Number.
d. Work.
Experiment with fertilizers.
Experiment with soils.
Improve varieties of grain.
Improve varieties of fruit.
Improve breeds of live stock.
To study habits of noxious insects and devise means of destroying them.
To study diseases of domestic animals, and to provide means for their prevention and cure.
e. Specialize.
f. Bulletins.
g. Results.

3. Department of Agriculture.
a. 1862 Organized.
b. 1889 Made an Executive Department.
c. Bureaus.
Weather Bureau.
Bureau of Plant Productions.
Bureau of Soils.
Bureau of Forestry.
Bureau of Chemistry.
d. Lines of Investigation.
Improvement in plant production.
Study of soils.
Study of rotation of crops.
Improvement of live stock.
Issue of bulletins.

VI. Soil.
1. Agencies in Formation.
a. Atmosphere.
b. Sunlight.
c. Water.
d. Plants.
e. Animals.
2. Composition.
3. Kinds.
a. Alluvium.
b. Sandy.
c. Clayey.
d. Lime.
e. Peaty.
f. Loam-humus.
4. Fertilizers.
a. Natural.
Manures.
b. Commercial.
Fertilizer.
Guano.
Menhaden.

VII. Plants.—Seeds.
1. Development.
2. Roots.
a. Function.
3. Stems.
a. Function.
4. Leaves.
a. Function.
5. Fruit.
6. Germination.
7. Fertilization—pollen.
8. Uses.
a. Purify air.
b. Loosen earth.
c. Fertilize soil.
d. Serves as food.
9. Enemies and Diseases.
a. Fungi.
b. Smut.

VIII. Correlated Subjects:

Agrarian Law.
Agriculture.
Agricultural Colleges.
Agricultural Experiment Stations.
Animals.
Ant.
Atmosphere.
Banking.
Barometer.
Bean.
Bee.
Beet-Sugar.
Birds.
Botany.
Bread.
Breeds.
Building.
Butter.
Cattle.
Climate.
Cheese.
Clover.
Coal.
Commerce.
Dairy.
Distillation.
Dog.
Education.
Emigration.
Ensilage.
Farmers' Institutes.
Fish Culture.
Flax.
Floriculture.
Flour.
Forests.
Fruit.
Fungicides.
Grasses.
Granges.
Guano.
Grasshopper.
Horticulture.
Harvesting.
Heating.
Honey.
Hops.
Horse.
Hunting.
Insects.
Insurance.
Jute.
Land.
Lease.
Law.
Maize.
Mensuration.
Oats.
Oils.
Manure.
Parasites.
Potatoes.
Poultry.
Pumpkins.
Rent.
Salts.
Sequoia.
Sewage.
Sheep.
Sugar.
Swine.
Threshing Machinery.
Tobacco.

QUESTIONS ON AGRICULTURE.

How many things can you name on your table dependent on the farmer—remembering that milk, cream, meats of all kinds, flour, and all vegetables are his products?

If your field of wheat is attacked by rust or chinch bugs what crop should follow to destroy the pest?

To what extent is Roosevelt interested in farmers?

Why are farmers considered the backbone of a nation?

Give a number of inventions in farm machinery and results of their use.

Does agriculture now rank as a science?

Where will the influence of scientific farming be felt first, on the small or the large farm? Why?

Are individual farms becoming smaller? Why?

Can scientific methods on small farms balance the loss in acres, do you think?

What is the average size of English farms? Of farms in the United States?

What is the demand abroad for our agricultural products?

What are the chief agricultural products of Europe?

Name our agricultural exports and imports.

Why did the government become interested along this line?

What are they doing along the line of reclaiming arid districts in the United States by irrigation?

What are experiment stations? What are the direct benefits to the farmer?

Who were the foremost people in agriculture in ancient times? Tell of their methods and knowledge.

Growing crops are subject to what dangers in general?

What particular blight threatens each of the following: Cotton? Oats? Corn? Wheat? Hay?

What is the government doing along this line?

At what date did the United States government take up the subject of agriculture?

What do we mean by the term "specializing" in farming?

What are the benefits of specializing in farm work?

Are most of the farmers what we may term "general farmers"?

Why is progress along scientific lines in farming of slow growth?

What is the value of the rotation of crops? Give some of the beneficial results obtained?

Of what interest and value are farmers' institutes?

What are the chief ingredients of fertilizers brought from the slaughtering houses?

What references are made to the grain and corn products of Egypt in the Old Testament?

Agriculture is the basis of all other arts. Why?

In a bushel of oats weighing forty pounds how many pounds would constitute the meal?

What is winter wheat? Spring wheat? What is the annual production in this country?

Were potatoes known in Europe before the discovery of America?

What is the chief importance and value of beets?

Name some of the materials found in your home dependent on flax. How does flax enter into the painting of your home?

Where is tea successfully raised in the United States? Rice?

Where is tobacco raised? What is the height of the plant? What part of it is used?

What remarkable improvement in the tobacco plant has Burbank brought about?

If you should visit the farmers of Oregon, what crops would you find in their fields?

What would you find to be the principal crop on the Kansas farm? On the one in Michigan? In Pennsylvania? In Kentucky? In Virginia? In Manitoba?

Of what great value to the agriculturist and horticulturist are some of Burbank's wonderful discoveries and experiments?

How many sheep are slaughtered in the United States yearly?

Irrigation

I. Definition and Purposes.

II. Ancient.

1. Egypt—China—India.

2. United States—Mexico.
   a. Indians.
   b. Spanish missionaries.
   c. Miners turned attention to agriculture.
   d. Mormons.

III. Modern.
   1. Egypt.
      a. Dams across the Nile increased irrigable area how many million acres?
   2. United States.
      a. What acreage reclaimed in west and southwest?
   3. Other sections of world.

IV. Necessities of Irrigation.
   1. When annual rainfall is less than what amount?
   2. When rainfall is distributed how?
   3. For crops requiring what?

V. Methods and Aims.
   1. Preserving rainfall where?
   2. Saving of waste water, where and how?
   3. Distribution of water to what districts?

VI. Statistics.
   1. Size of farms.
   2. Amount of water used.
   3. Engineering feats.
      a. Tunnels.
      b. Reservoirs, etc.

VII. Government Aid.
   1. Reclamation Law.
   2. Work accomplished.
   3. Work projected.

QUESTIONS.

What is irrigation?

Why is it necessary for government to carry on this work?

What important law has been passed relating to irrigation and what are its provisions?

What are some of the feats in engineering necessary in this work?

What parts of the United States are being reclaimed?

Locate some of the largest reservoirs and dams in United States.

In what foreign countries did irrigation originate?

How long are the dams across the Nile? For what are these dams used?

Who first practiced irrigation in the United States?

What is the outcome of irrigation in the Mormon settlements in Utah?

When is irrigation necessary?

What are the three lines of work in this industry?

What is the average size of an irrigated farm in the United States? In Utah? In California?

INTERESTING FACT ON IRRIGATION.

According to official figures, since the reclamation law was enacted by congress in 1902, eight towns have been built and 10,000 people have settled on what were desert lands. One hundred miles of branch railways have been built, 1,267 miles of canals have been dug, many of which carry whole rivers, and forty-seven tunnels have been excavated. It is estimated that the territory embraced in what is known as the arid regions of the United States covers 600,000,000 acres, of which about 60,000,000 acres are subject to irrigation and can be converted into farms fully as productive as lands in the most favored sections.

Refer to illustration on irrigation and tell of some of the results you see.
What is the income per acre of irrigated land?
What is the value of irrigated land?
What is the Reclamation Law? Where was it passed?
How many acres are included in the Reclamation Law?
For how many families will this provide homes?
What will be the expense of the government to irrigate this land?
From what great distances is water sometimes brought?
In what localities is irrigation dependent upon artesian wells? What are the methods?
What are flumes?
How fast has the irrigation of arid regions of the United States increased in the last ten years?

Corn

I. General Description.
   1. Stalk.
      a. Height.
      b. Jointed.
      c. Color.
      d. Structure.
   2. Leaves.
      a. Shape.
      b. Length.
      c. Position.
   3. Flowers.
      a. Silk.
      b. Tassel.
      c. Location on stalk, where?
      d. Location on ear, where?
   4. Fruit—Ears.
      a. Arrangement of kernels, and number on cob.
      b. Covering. What?
      c. Location on stalk.

II. History.
   1. Corn was first used and cultivated where and by whom?
   2. Use by whites dates from what time?
   3. Cultivation by other nations.

III. Kinds.
   1. Flint.
      a. Inferior grade. Cultivated where?
   2. Dent.
      a. The corn of commerce.
   3. Sweet Corn. Canning industry.
   4. Pop Corn. Commercial uses.

IV. Planting, Cultivation, Harvest.
   1. Planted how? Machinery used?
   2. Cultivated or plowed, how long? Machinery used?
   3. Harvested. When? Where placed?
   4. Fodder. What is it? How cut? How used?

V. WHERE CULTIVATED.
  1. United States.
    a. What per cent of world's supply?
    b. Annual yield in bushels?
    c. Valued at what?
    d. Importance as an industry?
    e. Income exceeding what two crops combined?
  2. Foreign Countries.
    a. Russia.
    b. Canada.
    c. Argentina.
    d. Austria, etc.

VI. PRODUCTS.
  1. Food. Importance in world as food.
    a. Mankind.
      Meal.
      Hominy.
      Hull corn.
    b. Animals.
      Whole corn and preparations for all live stock.
  2. Miscellaneous.
    a. Starch.
    b. Glucose.
    c. Alcoholic liquors.
  3. Cobs.
    a. Syrup.
    b. Fuel.
  4. Husks.

VII. MARKETS.
  1. Local.
  2. World.
  3. Board of Trade.

QUESTIONS.

Why called Indian corn?

How many dishes are made from corn meal in your home?

Start with the farmer and name the industries that arise or are dependent upon corn.

To what family of plants does corn belong?

How does corn rank as a food throughout the world?

AN INTERESTING CORN FACT.

Prof. Wiley of the Department of Agriculture says that inasmuch as every hundred pounds of cornstalks will yield six and a half pounds of absolute alcohol, it is obvious that the agriculturist has been allowing an enormous amount of wealth to go to waste.

Say that one acre will yield from ten to twelve tons of grain stalks, or about 20,000 pounds, and you have a quantity of raw material which will produce 1,300 pounds of absolute alcohol, or 216 gallons. Alcohol at the present time is worth 40 cents a gallon.

Ground in a wet condition and dried, cornstalks may be kept indefinitely and are ready at any time for conversion into alcohol. Prof. Wiley says that the alcohol derivable from the cornstalks that now go to waste in this country would not only drive all the machinery of our factories but would furnish the requisite power for all our railroads and steamboats, run all of our automobiles, heat and illuminate all our houses and light the streets of every city in the union.

What does corn contain that makes it valuable as a food?

In general appearance what plant does it resemble?

How many kinds of flowers has the plant? Which flower forms the tassel? Which the silk? What is at the end of each thread of silk?

Do the ears have an odd or even number of rows? How are they covered? Why?

Of what continent is corn a native? What is known of its use among the Aztecs and Incas? How far north is corn now cultivated?

What is the difference between the corn belt in the cool temperate regions and that of the warmer corn belt?

How does corn compare in value with wheat?

What is the average price of corn per bushel? What is the average yield per acre? What is the value of a crop on 40 acres of land yielding 65 bushels per acre?

What are the results of a failure in the corn crops of the United States?

Follow the corn from the field until it is returned to you as corn meal. As cornstarch. As sugar.

Describe flint corn. What are the two chief varieties of flint corn? Where is the yellow variety generally raised? Where is the dent corn grown? From what does it take its name? How high does it grow?

To what extent does the United States export corn? To what countries? Follow its line of travel from the village warehouse to its destination.

How does sweet corn differ from field corn? What great industry is connected with this article?

Why is corn used as a fattener of stock?

In what manner did the Indians grind corn? How is it cultivated and prepared for food by the native Mexican today?

How is corn planted? Cultivated? Harvested? When does the cultivation begin? Upon what do the methods of harvesting depend? What machines are now in use on the larger corn farms?

What proportion of people use it as a food? Give three forms in which it is commonly used.

Give three manufactured products made from it which are used extensively. From what is corn oil made? For what is it used?

Of what value are the stalks? How is green corn used as fodder? Describe the process in detail. (See ensilage.)

What proportion of the world's product is raised in the United States? Name the three leading corn-producing states.

How many billion bushels are raised annually in the United States? What is the value of the yearly crop?

How does this compare with the production of gold? Silver? Iron? Cotton?

What foreign countries produce large quantities of corn?

Milk

I. Description.—Liquid, odorless, sweet, opaque, etc.
II. Sources.
    1. Cow.
    2. Goats.
III. Composition.
    1. Solids.
    2. In Solution.

a. Water.
b. Caseine.
c. Sugar.
d. Fat.
e. Salt

IV. Uses.
1. Primary.
a. To support offspring of mammals after birth.
2. Secondary.
a. Food. Beverage, cooking, etc.

V. Products.
1. Cream.
2. Butter.
3. Cheese.

VI. Dairies.
1. Breeds of Cattle. Alderneys, Shorthorns, Jerseys, etc.
2. Separators, Butter-Making, etc.

VII. Creameries.
1. Owners.
a. Association of farmers.
b. Stock company.
c. Individuals.
2. Apparatus.
a. Milk and cream testers.
b. Milk tanks. Fresh and skim milk.
c. Cream tanks.
d. Engine.

VIII. Distribution of Milk.
1. Milk trains.
2. Milk wagons.

IX. Products and Exports of Factories.
1. Butter.
2. Cheese.
3. Oleomargarine.
4. Butterine.
5. Condensed milk or cream.

X. Government Inspection.
1. Adulteration.
a. Water.
b. Chalk, etc.

QUESTIONS.

If you could have but one food throughout life, which would you take—milk or meat?

What work is performed by the separator?

What is a creamery? Generally located where?

A MILK-TREE.

There are several species of the milk-tree in South America. That of Brazil is one of the largest trees of the kind. It furnishes a wood much prized for shipbuilding. The tree is tall, with large oval leaves and dark brown bark. It yields a fruit that tastes like that of strawberries and cream. A white milk flows when an incision is made in its trunk. This milk, like that which comes from a cow, can be used in tea and coffee. It will burn easily and gives out a green flame. It belongs to the family of fig-trees. —*Morton.*

What causes milk to sour? Give uses of sour milk. What is whey?

Name the different kinds of cheese. What foreign country is noted for its cheese?

How is milk regarded as a diet? Why should it be drunk slowly?

What makes cream rise to the top?

Why is cheese served with the last course at dinner?

In what ways can milk be adulterated?

Why does headache often follow the drinking of milk?

How is it possible for milk to be the means of spreading disease?

What steps has the government taken in regard to milk inspection?

Name some of the dishes prepared in cooking whose foundation is milk or cream.

Is milk an absorbent? What dangers lie in this fact? What are some of the rules for the taking care of milk?

Correlated subjects: Butter, Cheese.

Forestry

I. Definition.

II. Purposes.
   1. National government.
      a. Creation and maintenance of forest reserves.
      b. Prevention of forest fires.
      c. Reformation of present methods of lumbering.
      d. Reforesting of denuded areas.
      e. Coöperation with states to preserve forests within their boundaries.
   2. State government.
      a. Arbor Day—Origin and how observed—Aims, etc.
      b. Coöperation with National government.

III. Methods.
   1. Schools established by government in which experts are trained to devote their life to the work of forestry.
   2. Experts sent from these schools to lecture, etc.

IV. Uses of Trees.
   1. Shade and ornament.
   2. Windbreaks of farms.

Note (told by an Indian guide).—It was a pine tree growing in a gulch in Colorado, 8 feet in diameter and over 100 feet high. I had promised to return when this tree was felled and look the giant over. It fell with a crash on one of its huge limbs, splintering it so badly that it was useless as timber.

On making a study of it I found the tree to be 1,047 years old, a ring for every year's growth; quite a tree in the year 1340, over a hundred years before America's discovery.

For the first hundred years of its life it had had a prosperous growth, as rings were fully and largely developed. Then followed two years of poor, thin growth, as indicated by the rings succeeding the thick, regular ones. In the year 1491 a peculiar accident occurred; a tree growing near apparently toppled over upon it, two tips breaking off and being imbedded in that year's growth. In the year 1560 Indian arrowheads were found. In 1700 bullets had penetrated its sides. In 1807 results of an earthquake appeared. Dr. Woodpecker had also performed an operation, and, by the way, he does untold good in removing all traces of weevils, injurious insects, etc.

Time does not permit of giving further results of studying the cross section of this tree, its roots, branches, etc., but one familiar with this work cannot fail to be impressed with a feeling of sadness as he gazes upon the fallen giant, which has stood for centuries looking down upon the rise and fall of nations.

3. Prevent floods.
4. Hold moisture.
5. Hold sandy, shifting soil.
6. Leaves.
    a. Enrich soil.
    b. Protect soil.
    c. Coal, etc.
7. Homes for animals and birds.
8. Commercial value—See Lumber Outline.
9. Shelter and food.

V. PRODUCTS.
1. Food—fruit, nuts, syrup, etc.
2. Miscellaneous—medicine, tar, turpentine, resin, rubber, tannic acid, lumber, camphor, etc.

QUESTIONS ON FORESTRY.

From what species of trees is the furniture in your home made?
Name five fruit trees common to your orchard.
What varieties of trees are found in your neighborhood?
Of what uses are the fallen leaves? Those on the trees?
From where does our maple syrup come?
How do trees breathe? What is the circulation of a tree?
What uses are made of the barks of different trees?
Give a list of trees from which food is obtained used in your home?
Where are the immense forests of the world?
What does the traveler's tree furnish, from which originated its name?
From what trees are the following obtained—dyes, tar, turpentine, quinine, camphor, rubber?
What causes forest fires? What means have been adopted to prevent them?
Is Arbor Day observed at your school? In what states is it observed? What are the lasting effects of this observance?
Give height and size of some of the largest trees of which you have read?
What do we mean by hard wood trees? Soft wood? Name some of each.
What is the bottle tree? Why so called? Where grown?
Where is ebony procured? For what is it greatly valued? What are its prevailing colors?
What remarkable size is attained by the redwood trees of California and Oregon?
Where is the bread fruit tree grown? Why so named?
Where does the rubber tree grow? Describe the process of rubber making.
What species of trees would you expect to see were you to travel in the Hudson Bay country of Canada? In Alaska? In Brazil? In the Philippine Islands?

BUTTER FROM TREES.

The fruit of the butter-tree of India yields a fixed oil which has the appearance of butter, and which may be used for all the purposes that cow's butter is used.

A NATURAL STREET-LAMP.

The traveler in the forests of India is often startled by the appearance of what seems to be an electric street-lamp. A nearer approach reveals the fact that the "lamp" is a bird's nest plastered all over with enormous fireflies, which are alive and attached to the nest by bits of moist clay. The baya bird that owns the nest does not like darkness, and has thus devised this plan of utilizing the lamps of the glow-worms.

—*Morton.*

Lumber

I. KINDS.
   1. Hardwood—mahogany, rosewood, ebony, etc.
   2. Soft woods—pine, cedar, etc.

II. SAW MILLS.
   1. Location.
      a. Lumber camps.
      b. Seaports, inland cities.
   2. Methods of sawing and handling trees.
      a. Large timber—Machinery.
      b. Small timber—Oxen, etc.
      c. Transporting to mill.
   3. Product.
      a. Rough lumber—logs, poles, planks, railroad ties, etc.
      b. Finished lumber—veneers, flooring, siding, interior finishings.
      c. Finished articles—furniture, implements, etc.

III. TRANSPORTATION OF LOGS TO DISTANT SAW MILLS.
   1. Methods.
      a. Rafting.
      b. Shipping by rail or water.

IV. DRYING.
   1. Kilns.
   2. Sun dried.

V. PURPOSES.
   1. Buildings—public and private.
   2. Railways—all equipment of wood, etc.
   3. Ship building and yards, etc.
   4. Furniture, etc.

VI. LUMBER PRODUCING COUNTRIES.
   1. United States—Wisconsin, Michigan, Minnesota, Washington, Maine, etc.
   2. Foreign—South America, Sweden, Russia, Germany, France, Mexico, Canada, Africa.

VII. COMMERCIAL.
   1. Fourth industry in United States.
   2. Leading industry in foreign countries.
   3. Lumber markets of world.

TEST QUESTIONS.

From what countries do our hard woods come?

What do we mean by veneers? Are they largely used? Where?

What cities in the United States are noted for their manufacture of furniture?

What determines the cost of different woods?

Why are mahogany and rosewood expensive?

In the construction of a frame house, what are the parts or pieces of lumber used and from what regions does the wood come?

Into what sizes are boards cut?

What are the names of the different pines used for lumber? Why is this wood largely used in construction work?

I finish my parlors in mahogany: trace from tree to room with the help of

the following, expanding same all along the line: Tree located on a large ranch in Mexico, fifty miles inland, up river. Cut down by native Mexicans or peons. Hauled to narrow gauge railway by oxen and with many others hauled to mill on ranch. Cut into large logs. Rafted down river with others to port, loaded on vessel. Shipped to Mobile. Cut into different sizes of boards, veneers, etc. (Explain processes.) Dried. Shipped to Chicago yards. Sold to contractor building the house. Give full details of work, etc., by referring to THE NEW PRACTICAL REFERENCE LIBRARY, and with the help of the following questions:

In what time of year is the cutting of timber carried on? Why?
Where do the lumbermen live during this work?
How do they fell the trees?
How are the logs transported to the saw mills?
How is a log raft made? How is it towed to the mill?
How is lumber manufactured?

Where are the important lumber regions in the United States?
What machinery is necessary in a saw mill?
From what are laths made? Shingles?
How are the big trees in California handled?
How does lumbering rank as an industry in the United States?
What is the value of the lumber produced yearly?
How many men are employed in this industry?
What skilful economy is practiced in the running of a saw mill?

Course of Study

The value of simple exercises and experiments in agriculture as a field of activity for the growing boy and girl is attaining a tardy but deserved recognition. The advantages to be derived from the study are at least the following: First, some information on subjects of great importance; second, the mental growth obtained from reasoning from cause to effect and from effect to cause; third, the mental development incident to the planning and successful executing of practical and valuable work. It is in the wish that these advantages may be extended even more broadly and enjoyed by an ever increasing number of American boys and girls that this course of study is included in the EDUCATOR.

It is believed that this work can be made genuinely interesting and helpful to the pupil, even though taught in the simplest way and by the most inexperienced teacher. Indeed, the more informal the method adopted in treating both the subject and the pupil the better will be the results obtained. The pupil's interest in all forms of nature will be enhanced. He will be led both to think and to do; the formal studies, as usually taught, do not do either. A connecting link will be formed between the school and the world outside.

Not all the work outlined need be done by each pupil; some of it is better adapted to older pupils; some to younger. Valuable and useful plans not included in this course may occur to the teacher, or it may seem wise to change the order in some cases, or even to omit some of the work altogether. We leave this to the teacher's judgment.

It is of the utmost importance that the pupil should actually do the work involved in carrying out the exercises, wherever possible. The training received by the pupil in actually doing the work is of far greater importance than the information he acquires in the process.

Some of the exercises are given in the form of experiments to be made; some, of papers to be written; and some, of questions to be answered. All information called for, which cannot be secured by outside inquiry, will be found under the appropriate headings in THE NEW PRACTICAL REFERENCE LIBRARY.

FIRST MONTH.

WEATHER RECORD.

Hang your thermometer where it will be protected from the extreme temperatures of both summer and winter. Rule a blank book in a manner suitable for keeping a temperature record throughout the school year, including temperatures taken at nine, twelve and four o'clock. Also record early and late frosts, description of the severest storms and other unusual weather conditions.

Prepare the following apparatus for making record of rainfall:

A deep, narrow cylindrical dish of tin or galvanized iron, a funnel of same material, having a diameter across the top just three times the diameter of the first dish, and made to sit firmly in it. Put it up securely somewhere, at a distance from buildings so it will not catch water from the roof. Measure the rain after each rainfall with a finely graduated rule, but record only one-ninth of your measurement, because the difference in the diameter of your dishes has increased the depth of rain nine times. Make a place for recording these measurements in the same table with your temperature record.

What is the nature of the land in your neighborhood as to roughness of surface? Presence of forests? What kind of a surface must land have in order to be well fitted for agriculture? How does the land in your country compare with land in other parts of the country in these matters?

What is soil? Is the soil in your neighborhood chiefly sand, clay, vegetable or loam? Get and preserve samples of as many different soils as you can find in your neighborhood; examine them carefully, classify them as suggested above, and decide which you think is best adapted for growing crops. What adjective do we use in describing such a soil? What kind of soil is there on your farm? Do corn, oats, wheat and potatoes all thrive equally well in the same kind of soil? What kind of soil is best adapted to each? What crop thrives best on your farm?

Is the soil only on the surface of the ground, or does it extend a long distance downward? Can soil wear out? What can be done to prevent its wearing out? What is meant by "rotation of crops?" Is new soil made when old soil wears out? If so, where does it come from? What becomes of the old soil? Notice the dirty water flowing along the road after a hard rain. Is there soil in it? Where does this soil go to?

Will soil alone grow crops? If not, what else is necessary? Cultivation of the soil loosens it so the plants can get through, lets air into it, and prevents it from drying out quickly, thus making it more productive in a dry season.

In the different samples of soils which you collected plant some common seeds, such as peas and beans, and see which soil gives you the best results.

Name the eight leading farm crops raised in your vicinity; the five most common vegetables and the five most common fruits. Discuss the different uses of each one and its comparative importance.

Make collections of each of the grains and seeds which you have enumerated and keep each collection in a separate envelope or little pasteboard box, labeled with name of contents and name of collector.

SECOND MONTH.

What weed in your neighborhood causes the most trouble to farmers? Which will thrive with the least care, crops or weeds? Which are hardest to kill? Some weeds spread by growth from the roots; some by producing millions

of seeds which become dry and are scattered by the wind. Study some of the weeds in your neighborhood by collecting samples of their seeds, as you did in the case of the grains. Decide whether each weed spreads by its roots or its seeds. Select certain patches of each kind and see if you can kill them out so they will not grow next year. Notice the soil where these weeds grow and compare it with the soil where grains grow.

What are the most common trees in your neighborhood? Do they have seeds? Gather perfect leaves of each one; press them in a book and label each with name of the tree from which it came and name of the collector. Classify the kinds of trees from which the leaves came as to: 1st, commonness in your neighborhood; 2nd, size; 3rd, color and hardness of wood; 4th, roughness of bark; 5th, use of wood. What common tree yields one important product during its life?

Fill a box about one foot square and one foot deep nearly full of warm, moist earth, at different places in it plant two or three kernels of corn, two or three peas and one fair sized potato. Keep careful watch of your plantings and once each week for a month take up each plant very carefully, examine it, record description and make a drawing; then very carefully restore it to its place. The soil must be kept moist, and not allowed to get cold.

Name the domestic animals that are useful only after death; those useful only before death; those useful both before and after death.

Make a map of your township, showing all main roads, streams, churches, schoolhouses and farms. Calculate how far the average country pupil has to go to school.

THIRD MONTH.

In a suitable box, in one corner, plant a few kernels each of oats, wheat and barley, one inch deep; in another corner make a similar planting four inches deep; in the third and fourth corners make plantings seven and ten inches deep. Make a record of the depth of your planting and the time when each sprout appears above the soil.

Write an essay on each of the following: Cow, sheep, pig, poultry, discussing among other things:

1. In what way most useful.
2. Average weight.
3. Average height.
4. Reaches prime at what age?
5. How many kept on average farm?
6. How many legs has it?
7. General description.
8. Food eaten.
9. Peculiarities of teeth.

How many chickens are kept on your farm? What breed are they? What breed is best for egg-laying? What else are chickens used for? What is their most profitable use, and what breed is best for this use? How does the profit received from the poultry on your farm compare with that from the grain? From the milk? How does the value of the poultry products of the whole country compare with the value of the wheat crop?

Enumerate all the products of some farm that you are acquainted with and classify them as to products of the soil or animal products; compare the values of these different products; what is the total profit yielded by the farm for the last year? The average profit per acre?

Learn to spell and locate the following parts of a horse's body: Gullet, muzzle, withers, hock, pastern, coronet, arm, crest, hamstring, croup, cannon, fetlock and hoof.

FOURTH MONTH.

Make plantings of beans and an onion (not onion seed) similar to the planting suggested for the second month, and make observations and records in the same way.

From what source does the earth get its heat? Is cold something positive like heat, or is it due merely to the absence of heat? Where on the earth's surface is it hottest? Where is it coldest? Why this difference? What is climate? In what kind of climate is it healthiest to live? In what part of the world is such a climate found? How does the climate influence the development of a people? Compare natives of South America with those of North America.

From inquiry among farmers find out what it costs to keep their horses a year, and calculate the average cost per horse per year. Do the same with sheep, cattle and swine.

What is the best breed of cattle in your neighborhood for beef purposes? For giving milk? How much milk will a good cow of this breed give a day and what per cent of butter fat will it test? Compare these figures with those from an ordinary cow. How does milk compare with other products of the farm as a source of profit? How many cows per acre can be profitably kept on a farm?

Select several ears of corn; measure and record the length of each and its circumference at the middle of ear; count the rows and kernels in each row. Break the ears in two and make drawings of the cross-sections. Shell off all the corn (saving the kernels) on one side of each ear, and make a drawing of that side, showing the edges of the kernels; shell off all the corn and compare weight of each cob with weight of the corn that came from it. What per cent of weight of both is really corn? What is the average value of the annual corn crop in the United States? Of what country is corn a native? How many kernels of corn should be planted in a hill? How many stalks usually grow in a hill? Are all corn cobs or kernels the same color? How many ears usually grow to a hill? Calculate how much it costs to raise an acre of corn, including seed, labor, rent, machinery, etc.

Write a history of the farm on which you live from the earliest time that you can get information, tracing its ownership from the government, if possible, telling when it was first cultivated, when its buildings were erected, etc.

FIFTH MONTH.

Make a map of your farm showing its different fields, buildings, barnyard and houseyard; how many acres are planted to each crop, how many acres are in pasture, etc.

What is the principal constituent in milk? What are the two next most important constituents? How does cream differ from milk? In what two ways can it be separated from milk? Inquire about and name all the ways in which milk or its products can be used. In what way is most of the milk produced in your neighborhood used? Do you know of any other animal than the cow whose milk is used for food? What happens to milk that has become too old? What hastens this action? How can it be prevented?

With a knife introduce some of the matter of a rotten apple into a good one, then set it away and watch results.

How do plants and flowers get their moisture? Put a small, live, green plant in a bottle of red ink and watch results for several days.

Make a plan of your barn, or an original plan that you think would make a good farm barn.

If your father is fattening some pigs see if you can weigh one of them; then keep track of the corn fed to it and calculate whether the corn would have brought more if sold at the market price.

Compare the condition of some piece of machinery that has stood out of doors a good deal in rain and snow, freezing and melting, with machinery that has always been protected from the weather. Which method of treating machinery do you think will make it last longer?

SIXTH MONTH.

Inquire from some dairyman and write an essay on the best method of caring for milk cattle and for the milk after it has been drawn and before it has been delivered to the creamery.

What is temperature and how do we estimate it? Describe a thermometer. What is the freezing point? The boiling point? Name all the uses of the thermometer of which you can think.

Cut a lemon, an orange, a banana and an apple in two crosswise pieces; describe carefully and illustrate, by drawing, what you see.

Take samples of several different kinds of grains that your father intends to sow in the spring; carefully count each kernel, also any other seeds found in the grain, and estimate the percentage of purity of the grain.

If there is in your neighborhood a good example of a pure breed of some domestic animal and you can get the necessary information, write an essay on it, telling all the interesting things you can find out and showing how the breed is superior to common animals of its kind.

Find out by inquiry some of the most troublesome insects in your neighborhood and write an essay on each, mentioning among other things: Name, size, color, number of wings, number of legs, how it makes itself disagreeable, time of year and time of day at which it appears, whether it attacks people or animals and how it can be got rid of.

SEVENTH MONTH.

What are clouds? Of what good are they? Describe different kinds of clouds. What is dew? Do you find it only on top of the leaves, or on the under side also? Where do you think it comes from? What makes it form on the leaves? How long does it remain and what drives it away? Put some cold water in a pitcher or pail and let it stand in a warm room. Does dew appear on the dish? Where does it come from? Where does it go and why? Compare frost with dew and answer above questions in regard to it.

Select eight ears of corn to test. Fill a shallow box about two feet square half full of warm, moist earth or sawdust and cover it with a cloth wet in warm water; number each corner and middle of each side of the box with numerals from 1 to 8; take six kernels from each ear of corn and put them in the box near one of the numbered places, at the same time numbering the ears to correspond with the numbers on the box. Cover box and corn with another warm, wet cloth and at the end of five days see what kernels have sprouted and calculate what percentage of the corn from which the eight ears were taken will reproduce.

Plant in a suitable box, at the same depths, seeds of the pumpkin, squash and cucumber; record time of each appearance, describe the sprout and make a drawing of it.

Make a careful study of the horse, using the following outline, which is developed from the information furnished in THE NEW PRACTICAL REFERENCE LIBRARY. Write an essay embodying this information and answering all questions suggested.

HORSE.

- DESCRIPTION.
  - Hoof.
    - Shape.
    - Formation.
  - Legs.
    - Number.
    - Shape.
    - Parts.
  - Body.
    - Form.
    - Grace.
    - Structure.
    - Tail.
  - Head.
    - Shape.
    - Beauty.
    - Ears.
    - Mane.
- CHARACTERISTICS.
  - Intelligence.
  - Senses.
  - Fleetness.
  - Strength.
  - Faithfulness.
- CLASSIFICATION.
  - Draft horses.
  - Ponies.
  - Thoroughbreds.
- USES.
  - Farming.
  - Traveling.
  - Hauling.
  - Racing.
- HISTORY.
  - Introduction into America.
  - Origin of
    - Thoroughbreds.
    - Draft horses.
    - Ponies.
    - Wild horses.
- FOOD.
  - Hay.
  - Oats.
  - Bran.
  - Grass.
- TREATMENT.
  - Kindness.
  - Care.

QUESTIONS ON THE HORSE.

Give five reasons why the horse is the most useful animal in existence.
When were horses first introduced into America? By whom?
How do you account for the wild horses found in America?
What three groups of horses are found in America? For what is each used?
What class of horses are considered to be the swiftest and most beautiful?
What state in the U. S. is noted for its race horses? What state raises the greatest number of horses?
How does the horse rank in intelligence with other animals?
In what way are the horse's senses more acute than man's?
Of what are horseshoes made? Why are they worn?
What can be said of this animal's affection?
What people are especially noted for their love of horses?
Tell some incident or story relating to a horse.

The Development of a Loaf of Bread

We present on the following page a suggestive study on the development of a loaf of bread. We believe a very interesting series of essays can be prepared and a great deal of interest will be created by introducing pen sketches illustrative. By assigning the pupils work of this nature and supplying them with The New Practical Reference Library, an interest can be created which will accomplish permanent and practical results.

THE DEVELOPMENT OF A LOAF OF BREAD

Observe whether the cow, horse and sheep eat grass in the same way. Can you tell the reason for the difference? Do they lie down and get up in the same way?

Watch carefully for the coming of the first birds and record the time of their arrival. Where have they been all winter?

Tie a string around the new, green sprout of some tree or shrub and note carefully the growth of the sprout as the season progresses.

Prepare a small garden in the school yard or at home and plant in it seeds of the common flowers and vegetables, taking care to have all conditions favorable. The ground should be kept soft, loose and free from weeds all the spring. Note the progress of your garden carefully and keep a record of the development of your plants and flowers.

Set out a maple, box-elder, or other quick growing tree and keep it in good growing condition.

Figure out now the average temperature at nine, twelve and four o'clock since you began keeping your record; also the total rainfall and the average daily rainfall.

Domestic Science

A few brief suggestions on Home Economics, or Domestic Science, are the logical and appropriate accompaniment of the course in Agriculture. The work as outlined below is purely suggestive, and that only as regards the subject matter; details and methods of presentation can best be elaborated by the teacher in the light of the needs and conditions of her particular case.

FOOD.

(a) Meat.
Kinds, Cuts, Food value, Ways of preparing, Digestibility.

(b) Bread.
Kinds, Food value, How made, Digestibility.

(c) Vegetables.
Kinds, Food value, How prepared, Digestibility.

WATER.

Sources, Kinds, Uses.

AIR.

Composition, Properties, Purity, Ventilation.

CARE OF HOME.

Sweeping, Dusting, Washing floors and woodwork, Making beds, Washing clothing.

CARE OF THE PERSON.

Amount of food and sleep, The morning wash, General cleanliness, Bathing, Caring for hair, teeth and nails.

SEWING.

Kinds of cloth and purposes of each, Threads, Needles, Styles of sewing.

Essays on Corn

We give you here a series of exercises on the subject of corn that have been prepared by pupils having access to the New Practical Reference Library. No work is more interesting to students than the preparation of illustrative work of this kind, if they are supplied with a work from which they can secure the necessary information.

An interesting exercise is also given in connection with this series of essays by showing some of the products of corn. Acquainting pupils with the value of such products will result in a higher appreciation of Nature's vast storehouse and a desire to become more familiar with her laboratory.

The reason composition work is often so unsatisfactory and pupils not enthusiastic over the preparation of such work is because they do not have the necessary help. For the teacher to ask pupils questions or assign them subjects for composition work and not supply them with the material for the development of such exercises, is simply to discourage the pupils rather than to encourage them. The exhaustive treatment given all school subjects in the New Practical Reference Library will make it an indispensable assistant to the teacher who desires to make her work interesting and successful.

We merely supply you with this series of exercises on corn as suggestive of what may be done on any school subject which may come up in connection with the school work. By reference to the New Practical Reference Library you will see that the material supplied in these exercises has been taken from the description of the various subjects as treated in that Library.

Our illustrations are simple and such as any pupil will delight in reproducing, but if the teacher feels her inability to introduce the drawing work effectively, very interesting work can be prepared by pasting on the illustrations. The abundance of such material supplied by the papers, magazines and the profusion of advertising will amply supply every demand.

The successful teacher finds it necessary to have exhibitions of school work so that patrons in visiting the school may be shown the progress of the pupils and we believe this series of exercises, tastily put up in the shape of a booklet, with an attractive cover design, would prove very effective for such purpose.

The publishers of this work will especially appreciate the development of any school subject from the suggestions and material furnished in the New Practical Reference Library and will be pleased to incorporate in future editions any valuable suggestions of this kind.

SUBJECTS

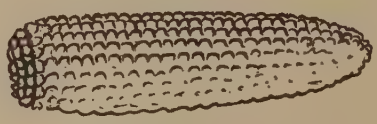
Description of Corn Plant.
Varieties of Corn.
The Testing of Seed Corn.
Preparation of Ground for Planting.
The Planting and Cultivation of Corn.
Enemies of the Corn Plant.
Modern Harvesting Methods.
Corn as a Food for Stock.
Marketing the Corn Crop.

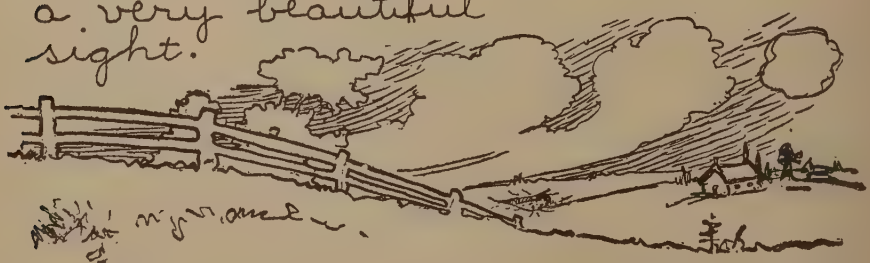
Description of Corn Plant.

Carolyn Ives.

Corn is a plant which belongs to the grass family and is raised in almost every warm or temperate country. The plant grows from four to twelve feet high according to the kind. The stalks are jointed, dark green in color, and concave on one side.

The ears grow from the axils of the leaves. The plant has two kinds of flowers. Those growing from the top are called tassels and bear the stamens of the flower. The other kind of flower is located on the ear and is called the "silk" and bears the pistils. A field of corn, when "tasseled out," is a very beautiful sight.



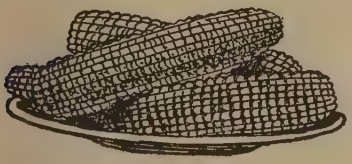


Varieties of Corn.

Ada E. Bateman.

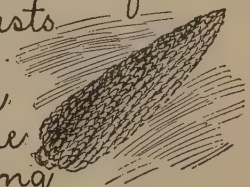
There are a great many varieties of corn. The most important kinds are flint, dent, sweet corn and popcorn. The flint corn has a small stalk and a small ear on which the grains are very hard and compact.

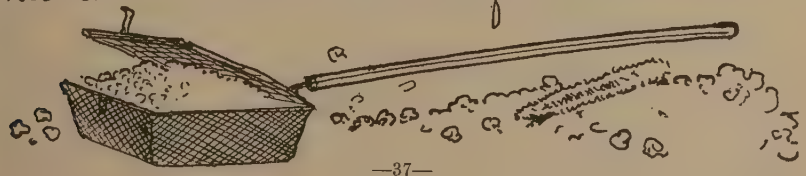
Dent corn is by far the most important and contains the greatest number of varieties. This corn is grown all over the corn belt region and furnishes nearly all the crop raised in this country.



Sweet corn contains a larger proportion of sugar than other varieties and is raised for food and eaten while green or canned.

Popcorn takes its name from the fact that the kernel when heated bursts open. The kernels are small and have an exceedingly tough outside coat. When heated the interior bursts through this coating and the kernel turns itself inside out.





The Testing of Seed Corn.

William Herbert.

The seed corn should be selected from corn which has fully ripened. The farmer should see that each ear is a good one, that the grain is plump and strong and that the ear is grained to the end of the cob at butt and tip.

After selecting the ears, the corn should be hung in a cool airy place, well protected from moisture. During the winter the corn should be thoroughly tested to see if it will grow for this is the only way to secure a good "stand" of corn. Grains should be selected from different parts of each ear and tested in a germinating box.

The ears from which grains were taken which sprouted weakly, if at all, should be discarded. Where grains proved strong those ears should be kept for seed.

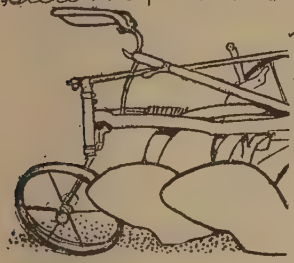
In the picture to the right part of the ears were good for seed and part of them were not.

Preparation of Ground for Planting.

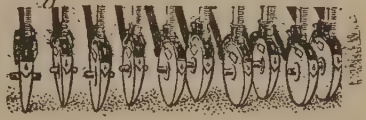
By Mary Marlin

The ground which is most suitable for corn growing is a rich loam containing a large per cent of nitrogen.

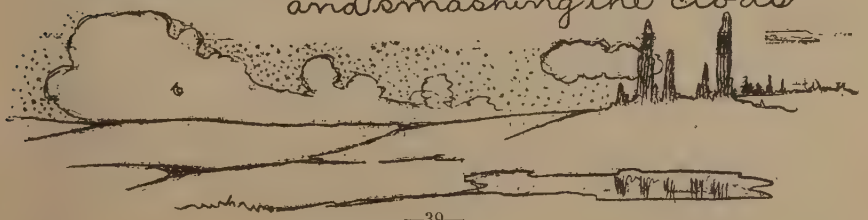
The ground is plowed, a riding plow usually doing the work. Often a gang plow is used and sometimes a steam plow. The gang plow is a riding plow in which several single plows are combined. The gang plow does the work very swiftly and smoothly and is operated by many horses or by a steam engine according to the number of plows in the gang.



After plowing, the land is harrowed or disced.



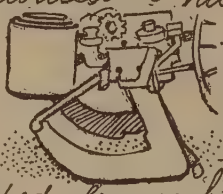
After discing thoroughly, the ground is next harrowed or rolled. By so doing it is prepared for the planting by smoothing the ground and smashing the clods.



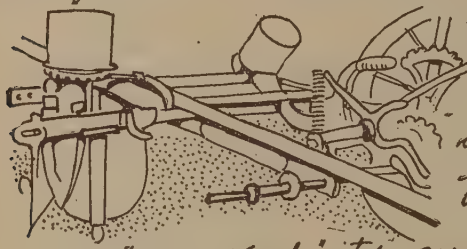
The Planting and Cultivation of Corn.

Mary M. Evert.

Corn is planted cultivated and harvested almost entirely by machinery. The corn planter generally used has two wheels and two sharp runners. These runners make a small furrow into which the seed is dropped from boxes above by a device known as a checkrower. The planter wheels press the dirt over the corn in the furrow.



Sometimes another kind of planter is used in which discs take the place of runners as shown in the picture.



As soon as corn "comes up" its culture is begun and is continued until it is ready to "lay by". In "tending" corn a cultivator is used to destroy weeds and to stir the soil. Cultivators have two wheels supporting a framework to which are attached beams bearing pointed hoe-shovels. From one to two rows are plowed at a time.

THE OLD WAY—WITH A HOE

Enemies of the Corn Plant.

Grace Shumway.

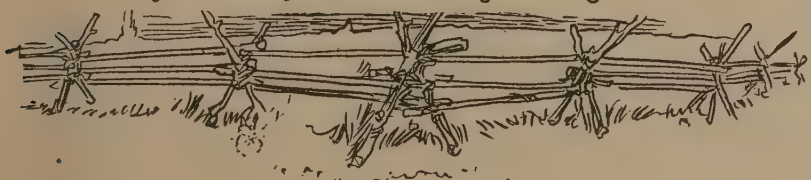
Larva beetles and root worms are some of the pests which reduce the yield of corn several million bushels each year.

The corn root worm bores its way into the root from the end. Soil which has produced corn for many years in succession is usually full of worms. They shorten the roots and destroy its power to feed the plant.

The cut worm is also one of the corn plant enemies, feeding upon roots and leaves and destroying much that it does not devour.

The chinch bug does the most injury working during dry years. Wet weather often destroys them.

These bugs multiply very rapidly. They gather in masses mostly on the stem and leaves of the plant. When food is gone they move sometimes a quarter of a mile, feasting on everything in the way.

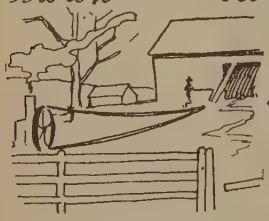


Modern Harvesting Methods.

Mary Arnold

The old methods of gathering the corn crop have given way to the newer and better methods. Instead of gathering the ears only, now, by utilizing the corn harvester, which is similar to the reaping machine, except that it works with a slower motion; the corn is cut and the stalks are pushed under a binding frame and raised on a platform. When the frame has been filled the shock is bound and then set upon the ground. The shocks are then hauled to the farm-yard and run through the corn shredder.

The essential part of the shredder are rollers containing flanges turning toward each other. As the stalk slides down a trough the rollers break off the ears and then strip the husks from them. Some shredders have sheller attachments on them.



THE OLD WAY—
WITH A CORN KNIFE

Corn as a Food for Stock

By Stella Akin.

Corn is a most valuable food for cattle and hogs. As a food the fodder is excellent and the ear is a most valuable fat producer. Thousands of bushels of corn are annually fed for this purpose.

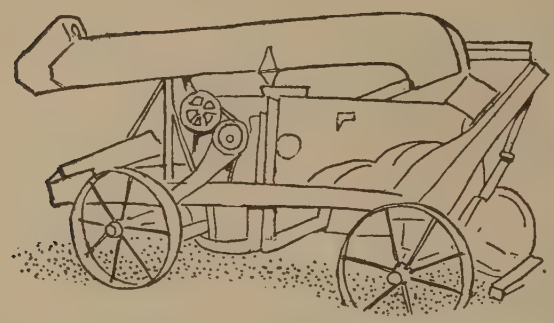
The fodder is placed in racks through which the cattle draw the stalks and the corn is thrown into troughs from which the cattle feed.

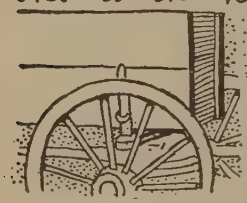
Great droves of hogs, especially in the west, are dependent upon corn as a food. The farmers build platforms in their hog yards on which they throw the corn or the corn is ground or cracked in a crusher run by horse power.

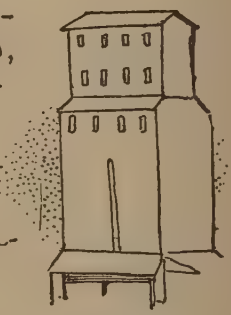
Marketing the Corn Crop.

Artie Clark.

After the corn is kept for a while in the crib it is usually shelled by a sheller run by steam or horse-power. The cobs are used for fuel and burn very readily when they are dry. The shelled corn is hauled in wagons to the nearest town to an elevator, where it is loaded into the grain cars and shipped to the large cities, from which it is distributed to the various mills and manufactories needing the products.







Movements toward the establishing of good roads and the reduction of freight rates are doing much in helping the farmer to market his crops at a great saving of expense. To move the crops with facility at harvest-time is a great problem.

CORN
PRODUCTS
THE UNITED STATES RAISES FOUR-FIFTHS OF THE CORN OF THE WORLD.
-NEW PRACTICAL REFERENCE LIBRARY-
FEED
CELLULOSE
ENSILAGE
MADE FROM THE
-STALKS-
PAPER
DENATURED
ALCOHOL
(NOTE PR.21
MADE FROM THE
GRAIN-
FEED FOR STOCK
POP CORN
EXCELSIOR BRAND BREAKFAST FOOD
CORN MEAL
ALCOHOL
CORN SYRUP
CORN STARCH
CORN OIL
HOMINY
SWEET CORN
GLUCOSE-LARGELY USED IN MAKING CANDY
MADE FROM THE
COBS, SHUCKS & LEAVES
-MATTRESSES- MADE FROM THE SHUCKS
-LEAVES- USED AS FOOD FOR STOCK
PIPES & FUEL FROM THE COBS
EATEN BY MORE PEOPLE THAN ANY OTHER GRAIN EXCEPT RICE
-NEW PRACTICAL REFERENCE LIBRARY-

What a piece of work is man! How noble in reason!
How infinite in faculties! In apprehension, how like a God! —*Shakespeare.*

Anthropology

The science of man as a study is of primary importance to the race. Taken in its broadest scope, it includes all the sciences in their relation to the history of human life.

These various subjects are outlined in this Educator under the topics of PSYCHOLOGY, PHYSIOLOGY, LITERATURE, etc., and found fully treated in THE NEW PRACTICAL REFERENCE LIBRARY.

As a direct study we present herewith an outline showing the various branches of the human race as developed from the treatment of the INDO-EUROPEAN, SEMITIC, and HAMITIC races, together with the many correlated subjects, as PHILOLOGY, SANSCRIT, etc., which are treated so interestingly in THE NEW PRACTICAL REFERENCE LIBRARY.

We also submit you outlines on the American INDIAN and CLIFF DWELLER, with suggestive questions. The successful student should not only develop simple outlines in connection with the study of the various races and types of people, but also in connection with the language, dress, sustenance, shelter, tools, weapons, their religious beliefs, family relations, customs, legends and superstitions, and the hundreds of sub-topics which will be found treated so interestingly therein. The observing student will find much of interest and value in a study of the splendid colored illustrations of the various races found throughout the LIBRARY.

TEST QUESTIONS ON ANTHROPOLOGY.

Name the races of man. What seems to have been the basis of this classification? Name the races found in your own city or county.

Why was the Caucasian race thus named? What territory is controlled by them?

Which are the more progressive, the Chinese or Japanese? What territory is inhabited by the yellow race?

What are the chief characteristics of the Malay or brown race?

Has a negro tribe ever been known to develop a civilization without help of other races?

Does Darwin account for origin of species? What is the Darwinian theory?

What are a few of the theories concerning the origin of man?

What are the characteristics that distinguish man from all other animals?

Is man the only animal with a moral sense of right and wrong?

Distinguish between the terms intellect and instinct.

Give reasons for the decline of the indian. What white people have intermarried with them?

How do the Mexican and Central American indians compare with those of the north and the extreme south?

When did the negro question in the United States become a national one?

Along what lines does Booker T. Washington advocate the education of the negro?

Is man a social animal? Give reasons for your opinion.

Give a few of the methods by which primitive man communicated with his fellow. Name methods of the present time.

Describe efforts of primitive man in his struggle for food, shelter, dress. Was dress originally only ornamental?

What were the weapons and tools of primitive man? Did he regard all men as brothers? To what bounds was his sense of right and justice limited?

How were sports and pastimes regarded by early peoples?

The Eskimos are supposed to be akin to what race? What does the word mean? How do they compare with the indians in progress? Why were the Cliff Dwellers so named?

Branches of the Human Race

I. Aryan or Indo-European Branch.
   1. Hindus.
   2. Persian.
   3. Armenian.
   4. Greek.
   5. Latin—Italic or Romance Nations.
      a. French.
      b. Spanish.
      c. Italian.
      d. Portuguese.
   6. Germanic or Teutonic Nations.
      a. English.
      b. German.
      c. Icelandish.
      d. Gothic (extinct).
      e. Dutch.
      f. Swedish.
      g. Danish.
   7. Celtic Nations.
      a. Welch.
      b. Gaelic.
      c. Irish.
      d. Breton.
   8. Slavonic Nations.
      a. Polish.
      b. Bohemian.
      c. Russian.
   9. Lithuanian.

II. Semitic Branch—Characteristic.
   1. Northern Section.
      a. Assyria.*
      b. Babylonia.*
      c. Hebrew-Samaritan, Moabites.
      d. Phœnician.
      e. Carthagenian.
      f. Aramaic—Chaldee, Syriac.
   2. Southern Section.
      a. Arabic—Arabia, Syria, Egypt, Barbary.
      b. Himyaritic.
      c. Amharic.

III. Hamitic Branch.
   1. Ancient Egyptians and descendants.
      a. Copts.
      b. Berbers.
      c. Ethiopians.

Note.—*Language recovered by means of the cuneiform inscriptions.

TEST QUESTIONS ON RACES OF MEN.

What races of men have you seen?

Name the different nationalities of the white race.

Are the races as distinct and separate as they were originally? Why?

Which race is the smallest in number? The largest? Give reasons.

Which race is the most civilized? Give reasons. The most barbarous? Why?

To what race does the native Mexican belong?

What nationalities are known as the dark type of Caucasian? The fair type?

What was the native home of each of the races and what are some of the causes of their wide distribution?

To what race does each of the following belong: Swede, Hindu, Italian, Japanese, Esquimaux, Russian, Spaniard, native Filipino, Turk, Arab, Persian, Jew, Pole?

What are some of the wandering tribes of the earth and their location?

What do you understand by the terms savage? Semi-barbarous? Give examples of each.

How did the Aztec Indians compare with those of the United States?

How does the Ethiopian race differ from the Caucasian races, mentally, morally and physically?

Who are the Bushmen? Hottentots?

Why are the peoples of Asia as a rule so much behind European nations in progress?

What people of Asia has adopted European customs and with what result?

What part of Asia is inhabited by the Caucasian race? Why?

Why was America colonized long before Africa?

What characterizes the nations that live along the seacoast?

Describe the native Australian. To what race does he belong?

Of what race does the greater part of Australia consist? What has caused this?

In a barbarous country how do the inhabitants along the coast compare with those farther inland? Where are the most ignorant people found in Asia and Africa? Give reasons.

The Chinese form what per cent of the world's population?

Does the degree of civilization of a country depend upon its age? Give an example to illustrate your answer.

What has been the main cause for the distribution of the negro?

The immigrants of the United States represent what nations?

What effect does climate have on the races of men?

Why does the Caucasian race dominate the world? What are the chief factors in their progress?

By reference to the colored plates illustrating Mongolian and negro types which would you say represented the highest state of civilization?

If all the peoples of the world were stood in a line, every fourth one would belong to what country?

Judging from the appearance of the Masai type of negro in colored illustration, what would you say as to his civilization? What is striking about his head?

By referring to Figure Nine of the Mongolian types, what uncivilized practice do you note?

What is remarkable about the costume of the Kashmir type as seen in illustration? For what are these people famous?

Indians, American

Indian Affairs
Indian, Education of the
Indian Reservation
United States Indian Training and Industrial School

Five Civilized Tribes.
- Cherokee
- Chickasaw
- Choctaw
- Creek
- Seminole
  - Osceola

Five Nations, The
- Cayuga
- Huron
- Iroquoian Indians
- Mohawk
- Oneida
- Onondaga
- Seneca
- Tuscarora

Algonquian
- Arapahoe
- Cheyenne
- Delaware
- Illinois
- Kickapoo
- Miami
- Narragansett
- Ojibway
- Ottawa
  - Pontiac
- Pequot
- Pottawatomi

Athapascan
Caddoan
Muskhogean
Shoshonean Indians
- Moki

Siouan

DISTRIBUTION.
North America.
- (a) Canada
- (b) United States
- (c) Mexico

South America.
- (a)
- (b)
- (c)

DRESS.
- Skins
- Woolens
- Feathers
- Shells
- Bark
- Tattooing

GAMES.
- Ball
- Racing
- Canoeing
- Fishing
- Hunting
- Singing
- Dancing
- Wrestling

INDUSTRIES.
- Blankets
- Baskets
- Pipes
- Knives
- Arrows
- Fish-hooks
- Leather
- Pipes

BURIAL.
- Earth
- Platforms

NOTE: It is to the credit of the indians of the United States that with but few exceptions they preferred death to any form of slavery or servitude, and have therefore maintained for the race final equality with the white men. —*Chancellor.*

ABORIGINES OF AMERICA

Origin
Number
Chronology
Ethnology
Civilization
Progress
Education
Characteristics
Appearance
Age
Size
Perpetual Warfare
Habits
Inventions
Money
Domestic Life
Cultivation of Soil
Occupation
Mode of Travel
Language
Records
Archaeology
Religion
Disposition
Endurance
Hieroglyphics
Government
Tribal Relations
Family Relations
Clans
Dwellings
Divisions
Savage
Barbarous
Half Civilized

—Roach—

TEST QUESTIONS ON INDIANS.

Were horses used by the indians before the Spanish explorations?

Who gave indians their name? Why?

What are the indian tepees or wigwams? How were they made by the plains indians? By those in the lake region? Why the difference?

How many indians are found at present in North and South America? How many of this number resided in the United States in 1900?

How and of what material were the houses of the Pueblos constructed and how arranged? What was peculiar about the houses in the lower tiers?

Without doors and windows, how did the Pueblos gain entrance to their homes?

By close observation of the Pueblo types as shown in colored illustration, what arts would you say were highly developed by this tribe?

In time of ceremony how did the indians dress and decorate themselves? When and why did they paint their faces and bodies?

What tribe made maple syrup? The cultivation of corn, beans, squashes, etc., was practiced by what tribe? Which tribe cultivated tobacco? What tribe hunted extensively?

How and from what did the indians make knives? Fish hooks? Needles? Axes? Pipes? etc. What did they make from rushes and grass? What was remarkable about some of their baskets? Did they know the art of making leather?

What specimens of indian work have you in your home?

What games did the indian boy play common to his white brother? What was the highest ambition of the Indian boy?

Where were the dead generally buried? What was generally buried with the deceased?

What were the duties of the medicine man? What were the great spirits of the indians? How did they consider the wind? The rain? How did they regard every living thing?

What are indian reservations? How many in the United States? Where is the largest in the country? Are the indians of reservations citizens?

Name five of the principal indian tribes. Name three of the principal indian wars.

What indian maiden saved the life of Captain John Smith? Whom did she afterward marry?

What indian name has been made world famous in one of Longfellow's poems?

What is meant by indian summer?

By a study of the various types of the human race as shown in colored illustrations, how do the indians compare in dress and intelligence with the Mongolian? With the negro?

What did the indians of Mexico and Central America know of books, astronomy, arithmetic, etc., at the time the Spaniards invaded their country? How did their civilization compare with the Spaniards'?

Cliff Dwellers

I. Origin.

II. Habitations.
  1. Kinds.
    a. Cliffs.
    b. Caves.
  2. Location.
    a. Mexico.
    b. New Mexico.
    c. California.
    d. Arizona.
  3. Construction.
    a. Methods.
    b. Material.
    c. Shape.
    d. Size.
  4. Purposes.
    a. Domestic.
    b. Protection in war.
  5. Ruins.
    a. Relics.
    b. Mummies.
    c. Pottery.
    d. Weapons.
    e. Utensils.

III. Civilization.
  1. Occupations.
    a. Agriculture.
    b. Irrigation—ditches, etc.
    c. Manufactures.
  2. Government.
    a. Tribes.
    b. Chief.

TEST QUESTIONS.

For what special purpose were the cave dwellings used? The cliff houses?

What other dwelling places have been found?

What proof have we of long sojourns in these places?

How many persons could a single "cliff palace" shelter?

What materials were used in the construction of their dwellings?

What do the circular ruins contain?

What are the theories regarding the use of the subterranean building in the center?

What determined the shape of the cliff houses? At what altitude were some of them built?

What have recent researches revealed as to their water supply? Ruins? Relics? Mummies?

What valley is strewn with ruins?

What strange symbols are to be seen on the walls?

What interesting discovery has been made by recent explorations?

What evidences of handicraft have been found?

Among what tribes was agriculture carried on?

What particular device shows their skill and industry?

What domestic animals did they raise?

Have the excavations ever resulted in the discovery of any metal objects?

Of what material were their weapons and other implements made?

What is a striking feature of their pottery?

The school makes possible the higher life when it teaches the pupil to think. Right thinking puts intelligence into the labor of his hands, increases his earning power, lays the foundation for his physical well-being, and lifts him above an existence that is a mere struggle for bread. —*Schaeffer.*

"In reading, as in everything else, nothing can be accomplished to much purpose without system."

—*John T. Dale.*

Arithmetic

The subject of arithmetic is generally looked upon as the most difficult to understand. It is easy to explain why it should be so considered since it requires persistent effort on the part of the student to master this subject, while many of the common subjects can be acquired by casual reading and recitation.

There has been a continual demand from parents for a help that will supplement the ordinary arithmetic and enable them to interest the student in this subject, and this demand has prompted us to supply this course, which is designed to make plain this important branch of study.

Never before has a general reference work attempted to embody a course of this kind. The hearty reception accorded the EDUCATOR and the fact that the NEW PRACTICAL REFERENCE LIBRARY so completely fills every demand on other subjects, will, with the addition of this splendid course on arithmetic, make this library ideal.

No subject is of greater import to the parent and teacher than the subject of arithmetic. It is one of the studies most conducive to mental development and the success or failure of not a few people is due to the development or lack of development of this one subject in their youth. If the reasoning powers are well developed by problems in arithmetic in youth, it will assist the pupil in the successful handling of the more important problems of life.

We give you here supplementary material so unique that the pupil can adapt much of it to his regular studies in a way that will prove fascinating and enable him to get a grasp of the subject that is impossible when presented only by rule. The exercises will also be of especial value to the parent, and many of them can be used to advantage in interesting the pupil in this subject.

The teacher will find these exercises adapted to her needs, and if properly developed in connection with the text will create an interest in the class work that is sure to result in successful teaching and develop a taste for the science of mathematics. If she avails herself of the many devices and plans here suggested she will relieve herself of the tiresome routine of school work and will be able to create an interest without the necessity of constant preparation and drudgery.

We think it much better to develop an understanding of the principles involved rather than to undertake to learn any set rules for the performance of the operations. We believe if the principles underlying the processes are developed carefully that the rules in arithmetic will take care of themselves.

If arithmetic is handled in this way it is sure to prove of lasting value to the pupils and they will be able to perform the operations which present themselves in daily business life in an understanding way when the rules which they might have learned at school would have been entirely forgotten.

We have given special attention to the fundamentals, realizing that a thorough understanding of these four operations will enable the pupil to master any of the succeeding departments much more readily and effectively.

Practical Suggestions

Arithmetic is simply a science of the method of counting and if this fact is kept permanently before the pupil it will prove of assistance. To begin with, we count by units, later by groups of units; in fractions we have the study of parts of units; and under denominate numbers, corresponding groups as indicated by the tables studied.

Teachers, burdened with the daily routine and duties of the school, welcome pertinent plans and opportune suggestions.

A pupil thoroughly drilled in the fundamental operations of arithmetic will not only be able to perform them with facility and accuracy, but will have made great progress towards an easy and complete mastery of the science of arithmetic.

The study of notation and numeration should aim at rapidity so that pupils write and read without hesitation numbers of four periods, knowing the names of these periods and their order. Give frequent practice in reading and writing numbers.

In practice, all that should be said or thought at each step in the addition of a column of figures is simply the amount.

Practical problems, dealing with things which are familiar to the pupils, are of far the most value and should be given wherever possible.

The one great end to be attained in the study of arithmetic is facility.

Aim to keep your pupils busy, for industrious pupils are orderly.

As an incentive to high standing, a good plan is to pin upon the wall all examination papers which are perfect.

A short lesson on rapid mental work will be of more benefit in solving every-day problems than much of the regular book work.

Teach by principle rather than rule and illustrate freely with problems.

Allow counting on fingers or by marks only in kindergarten work.

Progress in all cases should be gradual and thorough.

Try to teach your pupils to reason and explain their work in a clear and lucid manner.

Rules and definitions should be introduced only where they will help the student in retaining and understanding the subjects.

Problems in advanced grades should largely be original and made to include actual conditions in the surrounding life.

Farm arithmetic is entertaining and educational.

One of the greatest mistakes a teacher or parent can make is to assist the pupil too much in his work. Such methods will leave the pupil devoid of ideas and instead of creating individuality and habits of investigation will make him dependent on the reasoning powers of others.

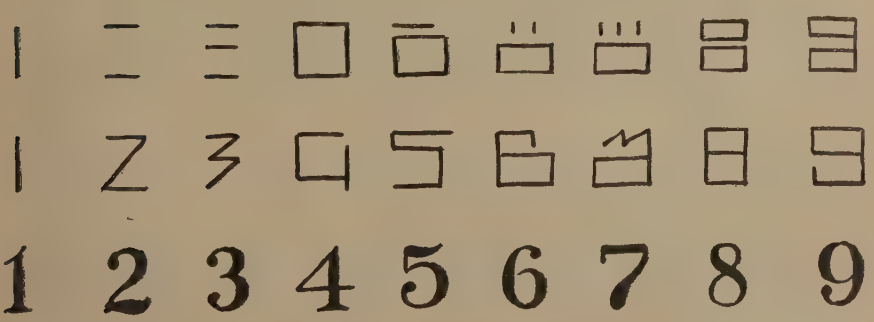
The amount of work done and the time given in which to do it should always be varied with the class or individual. Too much work will weaken instead of strengthen the pupil and a fixed amount of work in a stated time often ends disastrously.

Lessons given at school are not always understood and some pupils cannot always follow the explanations. The various illustrative suggestions and information given in this course will enable the intelligent parent to assist the pupil understandingly in this most important study.

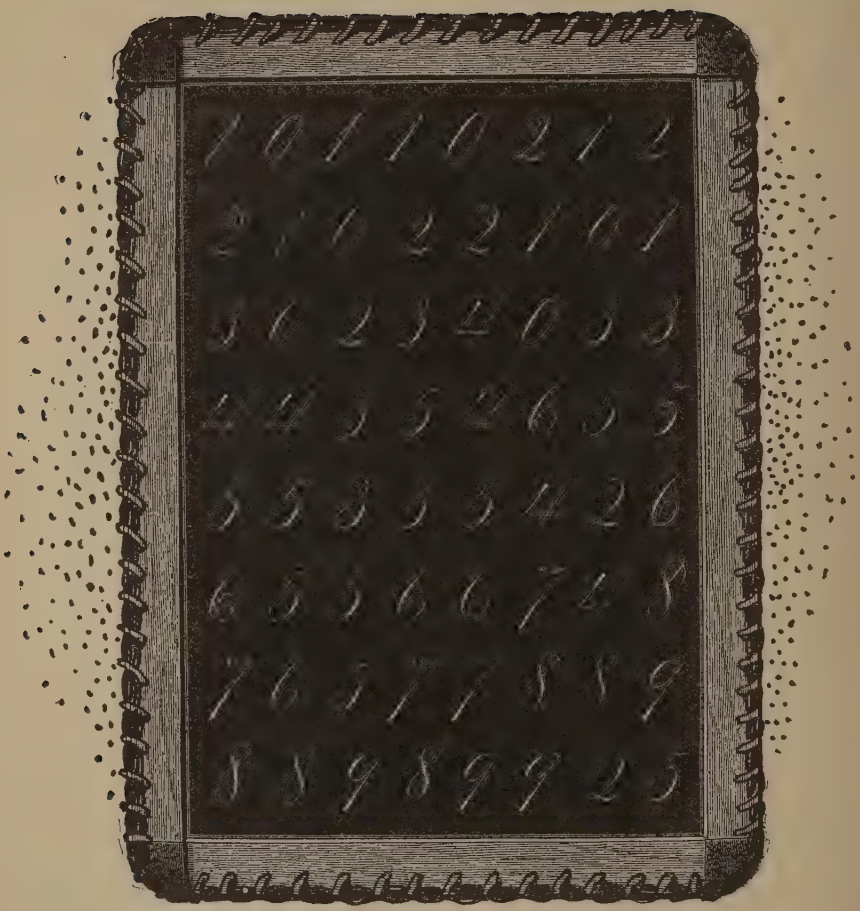
Nine-tenths of all the arithmetical work required of pupils after leaving the school room will be addition, subtraction, multiplication and division. Our work aims at the practical and for this reason we feel that they should be taught to do this work accurately and rapidly; much attention is therefore given to an interesting presentation of the fundamentals.

ARITHMETIC.

- Definitions.
  - Signs.
  - Arithmetic.
  - Principles.
  - Rules.
  - Operation.
- Classification of Numbers.
  - Integral.
  - Fractional.
  - Mixed.
  - Abstract.
  - Concrete.
  - Simple.
  - Compound.
- Operations.
  - Notation and Numeration.
  - Addition.
  - Subtraction.
  - Multiplication.
  - Division.
  - Fractions.
  - Decimals.
  - Involution.
  - Evolution.
- Signs.
  - Mensuration.
- Applied to.
  - Integers.
  - Fractions.
  - Proportion.
  - Percentage.
  - Interest.
  - Involution.
  - Evolution.
  - Mensuration.
- Rules.
  - Application.
  - Illustration.



The origin of figures is an interesting study and their development from a single mark for each unit to our present characters will awaken thought.



SLATE EXERCISE.

The above is a suggestive exercise of threefold value to the student. Pupils will delight in reproducing work of this kind, and a permanent copy for immediate use, as opportunity may present, will prove valuable.

It will keep pupils busy and in that way assist in maintaining order.

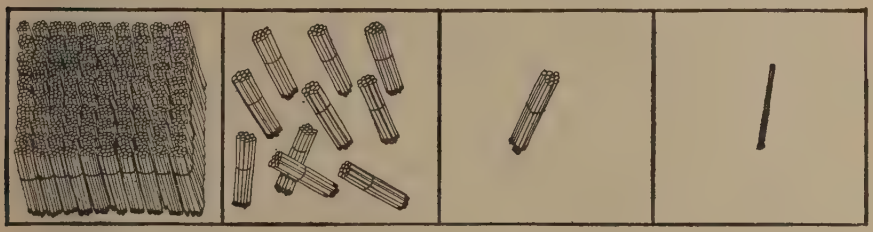
It will result in attractive work, which is always a desirable accomplishment.

It will prove educational, since attractive work will beget similar work in other lines of study.

Notation and Numeration

NOTATION AND NUMERATION.

- Definitions.
  - Notation.
  - Numeration.
  - Figures.
  - Decimal Point.
- Notation.
  - Arabic.
    - Characters.
    - Value.
    - Terms.
  - Roman.
    - Names.
    - Value.
- Numeration.
  - Order.
    - Names.
    - Value.
  - Periods.
    - Number of figures.
    - Names.
  - Value.
    - Increased.
    - Diminished.
- Examples.



Ordinarily pupils become familiar with twelve periods in reading and writing numbers, and while there is little necessity for learning so many periods, yet the information is so easily acquired that no effort need be made in attempting not to learn these periods. Pupils should be drilled well in the reading of numbers up to millions and should learn to write them readily.

We believe it is more essential, however, to learn the value of a number in the different positions and much time should be given by the teacher in developing this important feature.

Toothpicks and rubber bands can be used effectively in the development of this subject and by grouping the toothpicks in tens and combining ten groups into hundreds and showing the relative value of one in units' place, tens' place, hundredths' place and thousandths' place and then the relative value of two, we think a very impressive lesson can be developed.

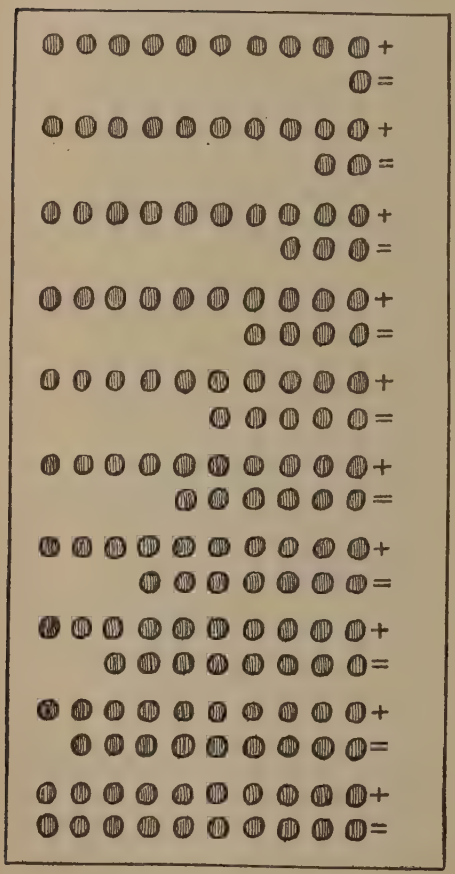
Very few pupils have at first any conception of the fact that the one in thousandths' place represents 1000 times the value it did in units' place, and we know of no better way to impress this fact than by using ten bundles of 100 toothpicks for the purpose.

An effective device can be used in this connection by arranging a small pasteboard box with four pigeon holes, labeling them units, tens, etc., and then in illustrating the value of one, place a single toothpick in units' box, ten in tens' box, and so on. In this same way the value of the other figures in their respective boxes can be demonstrated.

Addition

ADDITION.

- Definitions.
- Principles.
- Signs.
  - Signs.
  - Equality.
- Operations.
  - Writing.
  - Grouping.
  - Adding.
  - Carrying.
- Proof.
- Rules.

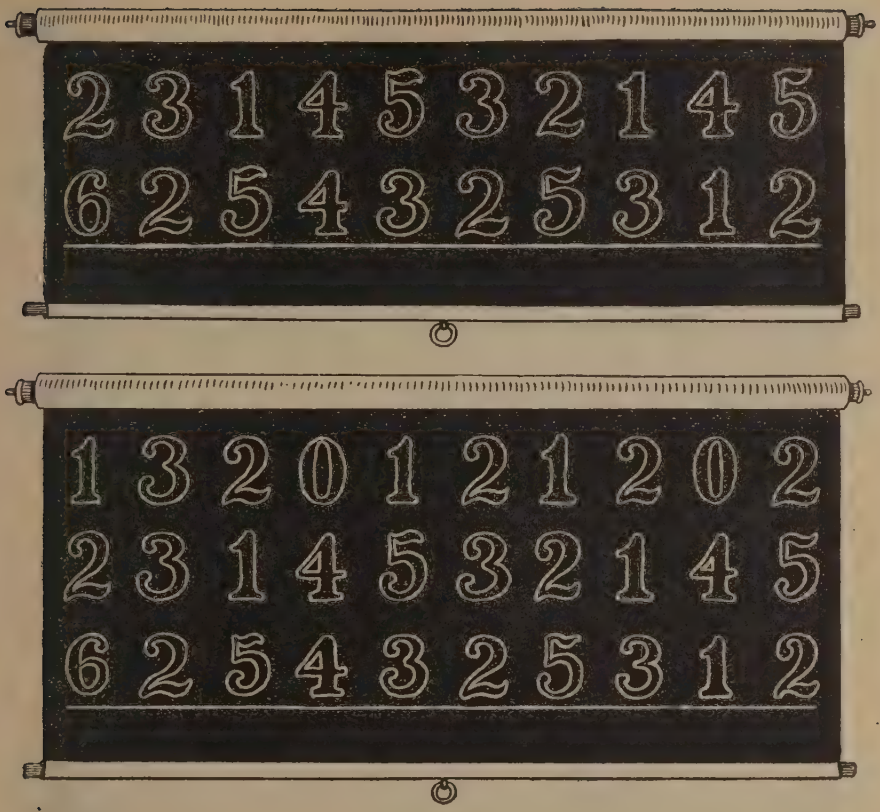


EXERCISE IN ADDITION.

In presenting arithmetic to the primary class, it is easier for the child's mind to grasp the addition of objects or pictured objects rather than written figures and for that reason a chart developed for drill work, like the one given, should be in the possession of every teacher who realizes the importance of the first steps in arithmetic. In developing a large chart for class use, pictures of objects can be drawn or pasted on the chart and a similar device used in subtraction, multiplication and division.

In the first two lines we give the simplest combinations, and for the first lesson in addition, by covering with a sheet of paper nine of the circles, the pupil can tell without hesitation that one circle and one circle are two circles; and continuing to uncover one circle at a time in the first row, till the class is perfectly familiar with the addition by 1 up to 10.

For kindergarten work this chart can be produced in colors or developed into pictures of apples, oranges or other interesting and easily represented objects, and insure the interest of the pupil. Color work and grouping will be combined in the one exercise, and many interesting lessons will be the result. The essential to success in this work is a constant drill, and the drill, to be effective, must not become monotonous. The many variations here suggested avoid this monotony and their adaptation insures success.



We believe that the exercise suggested here will prove very helpful in the home and in the school. It can be very easily prepared by using an ordinary window-shade roller and slated cloth. The figures can be put on the cloth permanently with chalk and mucilage and for the beginning pupil the shade can be drawn showing but two rows of figures. This will enable the mother or teacher to hear the recitation or drill the pupil on the combinations of the different figures by simply using a pointer, and a very rapid exercise can result which will prove effective in enabling the pupil to make the combinations readily.

As soon as they can handle two rows effectively the shade can be pulled lower and the third combination presented. You will notice there is no carrying required even with the three rows. The teacher can vary the exercise by pointing to the column and having the class answer in concert; by having one pupil stand and recite as the teacher points to the several columns; by having the class stand and recite in turn as the teacher points to the several columns; by having one pupil pass to the chart and with a crayon put down the answers as rapidly as possible, or by having the pupil put down the answers as rapidly as a certain pupil can call such results.

It is plain that these exercises can be varied and that a very important

essential to effective work in arithmetic, the rapid combination of numbers, can be acquired after the fashion of playing a game. The advantages of this kind of an education are two-fold in that it gives permanent information with little effort.

After the pupil becomes efficient with the first rows the shade can be lowered to any number of rows and the combinations be made more difficult,

including the carrying process. This same exercise can be used advantageously with the advanced classes in the various ways suggested, and pupils drilled with a chart of this kind will learn to combine figures in the fashion that they combine letters into words in reading, and they will give the results of the columns as readily as they would give the pronunciation of combinations of letters into words.

One of the special advantages, in addition to those already mentioned in connection with this chart, is the fact that the teacher is saved the time of writing on the board exercises for practice and the continuous erasing and chalk dust resulting from the ordinary exercise is practically eliminated, since there is but one row of figures to put down, should the exercise require the writing of the results.

This exercise will admit of so many variations in results that there will be no opportunity for the pupil to simply memorize the results.

VARIETY.

Never tire the pupil by keeping him at work for a long time on any table or any plan of recitation. Awaken his interest by a variety of exercises. Children especially should not be expected to develop mental growth wholly by application.

INTERESTING EXERCISE.

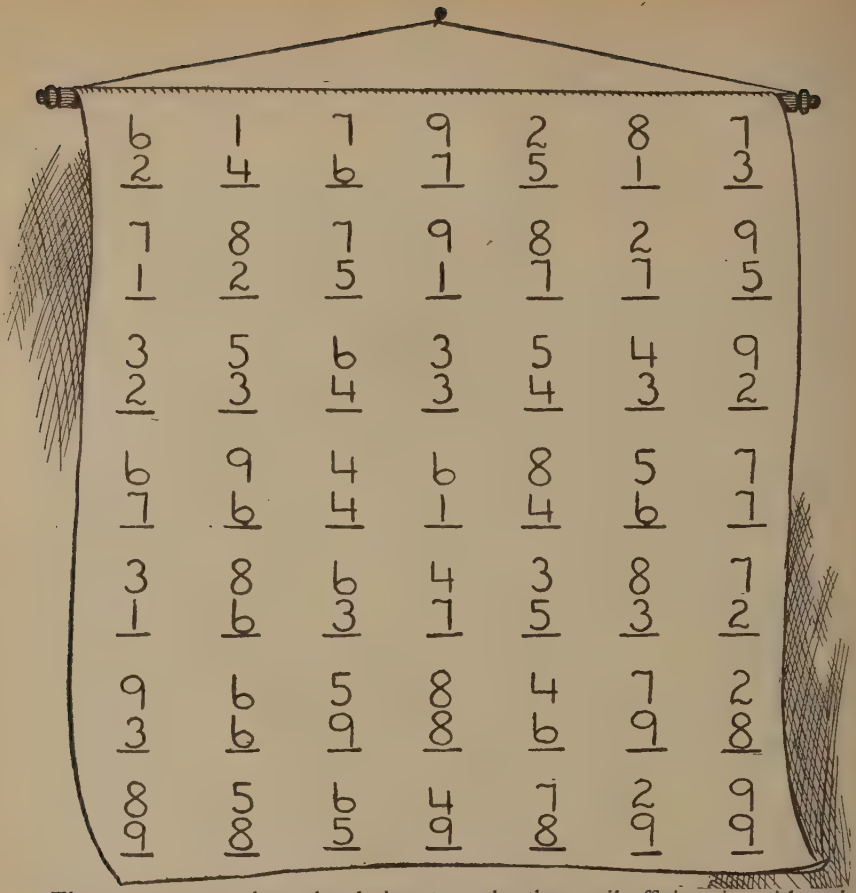
A very interesting exercise in the combination of numbers will result by developing the following suggestions:

These exercises should be greatly extended by the teacher and should be continued until the pupils can count with accuracy and rapidity. They may be recited in various ways.

An old-time method, and not in disrepute, would be to have the class recite in concert in the time indicated by the regular motion of the teacher's hand. This exercise is superior to the ordinary repetition of the tables, since it gives the results and requires thought without so much vocalization. Besides, the additions can be made beginning with an odd number and not give the regular answers to the table. It will be found much more difficult for the pupil to add by 4's, commencing at 3, than to simply give the combinations of 4's, yet such an exercise is very helpful to the pupil and exceedingly thought promoting.

Add by 2 to the number 40, commencing at 2.
Add by 3 to the number 61, commencing at 4.
Add by 4 to the number 51, commencing at 3.
Add by 5 to the number 67, commencing at 7.
Add by 2 to the number 49, commencing at 1.
Add by 3 to the number 38, commencing at 2.
Add by 4 to the number 45, commencing at 5.
Add by 5 to the number 42, commencing at 2.

Commence at 6 and add by 4 to 50.
Commence at 7 and add by 6 to 79.
Commence at 8 and add by 9 to 80.
Commence at 9 and add by 7 to 65.
Commence at 8 and add by 6 to 80.
Commence at 7 and add by 10 to 117.



The parent or teacher who desires to make the pupil efficient in arithmetic must drill persistently on the fundamentals. While the chart suggested herewith bears few marks of originality, yet its use will prove very effective in obtaining the results desired. No pupil can do effective arithmetic work unless he can make the combinations instantly of any two figures. The suggestion that we would like to make to the teacher is that this chart be reproduced so that it can be placed before the class for rapid work by the pupils and with the pointer have the pupils read the answers, varying the exercise to suit the occasion. The answers may be read from top to bottom, from bottom to top, from left to right and from right to left, as directed by the teacher. This may be varied by the teacher or pupil pointing miscellaneously to the combination and having the pupils give the results.

If the teacher does not prepare a permanent chart of this kind the result will be that she will seldom have such an exercise and the pupils will lose the value of such excellent drill work.

A carefully prepared chart of this kind will not only prove valuable during one term of school, but is a permanent asset.

Regular and persistent drill on the tables should be continued so that the pupil may be able to add the figures rapidly and accurately.

As an exercise on the addition table, give a number contained in the table and require each member of the class to write on their slates the various combinations that will produce the given number. It will even surprise the teacher the number of combinations found in 20.

After a drill on the table of eights, the teacher writes on the blackboard "8," and asks for all the combinations of numbers that, when added, will give this number. To begin with, the pupils will perform this exercise in an irregular manner, but a little practice will quickly develop in the bright pupils systematic procedure and they should be encouraged in forming the proper arrangement by placing the work on the blackboard and explaining it.

TABLE.

8=1+7		8+0=8
8=2+6		7+1=8
8=3+5		6+2=8
8=4+4		5+3=8
8=5+3	or	4+4=8
8=6+2		3+5=8
8=7+1		2+6=8
8=8+0		1+7=8

Pupils may be called upon to read their work and it should be carefully examined as to its correctness and neatness. Similar exercises can be given in connection with the various tables.

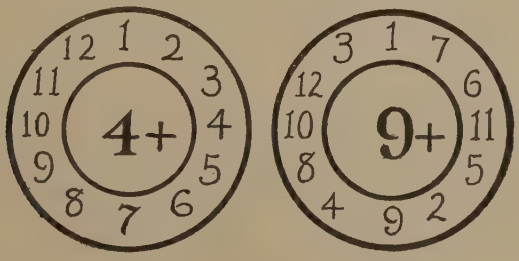
The many advantages resulting from exercises of this kind can only be hinted at. We suggest a few:

They teach the pupils how to write figures and signs properly.

It secures a thorough knowledge of the tables with only a minimum amount of effort.

It saves much time in future study of arithmetic.

It gives constant and pleasant employment to body and mind, when not engaged in recitation.



Another interesting suggestion for the acquirement of rapidity in the combination of numbers is given above. In the first illustration you have the combination as represented in the ordinary table as given, beginning with 1 and ending with 12. We think it preferable to use the latter illustration, which will give the combinations miscellaneously.

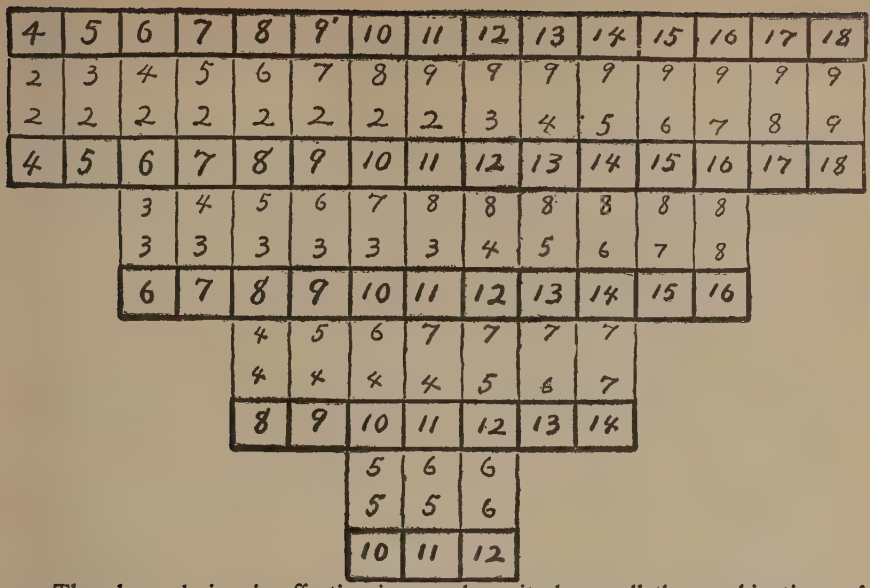
1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9
2 2	2 3	2 4	2 5	2 6	2 7	2 8	2 9	
3 3	3 4	3 5	3 6	3 7	3 8	3 9		
4 4	4 5	4 6	4 7	4 8	4 9			
5 5	5 6	5 7	5 8	5 9				
6 6	6 7	6 8	6 9					
7 7	7 8	7 9						
8 8	8 9							
9 9								

We give you herewith every combination in the Addition Tables. It will be noticed that when the pupil has learned all the tables to the nines that there is but one combination to learn to complete the table

The simplest way of showing all combinations in addition is shown by the above diagram. It will be noticed that combinations of 1 with all digits are represented in the first line, that there will be one less combination for the 2's, 2+1 being represented in the first line, and for this reason each succeeding table would necessitate one less combination until in the table of 9's, only 9+9 would not have been learned in a previous table.

Oral drill from this table, arranged in chart form or placed upon a blackboard, must be continued until the pupils are thoroughly familiar with these problems.

It is hardly necessary for us to suggest that the bright pupil and wide-awake teacher will prepare similar exercises for subtraction, multiplication and division.



The above design is effective inasmuch as it shows all the combinations of addends other than one that will produce any number from 4 to 18. A glance at the table will show you that only 2 and 2 produce 4, and that no other combination except 9 and 8 equal 17, while we have four combinations equaling 11 and a like number 10 and 12. Many questions can be asked the pupil from a chart of this kind and we merely suggest a few, leaving the rest to the student:

What addends in 7? In 9? In 13?

One of the addends in 11 is 9. What is the other?

One of the addends in 11 is 7. What is the other?

Make a list of addends which give 1 for units figure.

Make a list of addends that exceed 10 and give a 2 for the units figure.

(Similar lists can be made for each figure in the units' place.)

What addend with 6 gives a number whose right-hand figure is 2? 4? 5? 4? 3?

What addend with 9 gives a number whose right-hand figure is 7? 6? 8?

Addends that exceed 10 and give a 2 for units:

3+9
3+9
4+8
5+7
6+6

Addends that exceed 10 and give a 4 for units:

5+9
6+8
7+7

Addends that exceed 10 and give a 6 for units;

7+9
8+8

Addends that exceed 10 and give a 3 for units:

4+9
5+8
6+7

Addends that exceed 10 and give a 5 for units:

6+9
7+8

Addends that exceed 10 and give a 7 for units:

8+9

3	7	5	6	4	1	2	6
6	2	4	3	5	8	7	3
2	4	5	3	1	7	2	1
1	6	3	5	7	8	4	2
8	3	6	4	2	1	5	7
2	2	4	5	3	1	7	1	9

If the mother or teacher desires to give the child some helpful work in addition and does not want to take the time or trouble to make the footings she can use problems as given above and keep the little ones busy in a profitable way with very little expenditure of force on her part.

In the problem which we have shown the addends of each column in the first two rows equal 9. The same is true of the last two rows. It is plain that if two be deducted from the units of the middle row, that row preceded by a 2 is the sum. The exercise may be varied as often as it is written.

Interest might be augmented by having the pupil write the first line and the teacher write the second, being sure to make each column total 9. The pupil could then write the next line and the teacher the following, making the totals 9 as before. The line which the pupil would then write would be the result of the addition if 2 is deducted from the units and the entire number preceded by 2. This is apparent to the teacher but will not be readily discovered by the pupil if the exercise is varied. In the problem given, the key to the answer is the middle line. In the one which we have suggested it would be the last line. Of course, any line can be used for the key and should the pupil become acquainted with the combination it would be very easy for the wide-awake teacher to vary the same so that each figure in the key line would simply be one greater than the result, or vice versa.

One of the things necessary in effective school work is to keep the pupils busy and if care is used in this respect there will be little trouble in governing the school. Pupils especially appreciate exercises like this and they prove invaluable to them. The problem can be made any required length and several such exercises can be placed on the board with but very little effort on the part of the teacher and will prove busy work for a class for a considerable time, and will be in contrast to so much of the busy work being introduced into the schoolroom, which is merely a means of order-getting, rather than of especial benefit to the student.

RAPID ADDITION.

Persons quickly acquire skill in rapid addition by practice. A competitive exercise is often advantageous.

Ability to see and take in the result of two or more figures without stopping to add each figure separately is necessary, and a few minutes practice each day will surprise one with his ability to read results in figures, as in reading print the meaning of a word or sentence is known without spelling out each syllable or word.

CIVIL SERVICE METHOD.

Persons likely to be disturbed or surrounded by people engaged in conversation frequently use the following method, which enables one to detect and change any error quickly:

2480	13
725	28
6844	29
2893	13
3251	
	16193

BANKERS' METHOD.

The advantage of this method over the Civil Service Method is that the result is always in sight without the necessity of making the second addition, since the number carried is added in to each partial sum.

2480	**13**
725	**29**
6844	**31**
2893	**16**
3251	
	16193

CROSS ADDITION.

An interesting mental exercise is performed by adding to the upper number the units, tens, hundreds, etc., successively of the next number below. Variation can be had by adding from left to right or by beginning below and adding above. In oral recitation drop "and" and "are," simply giving results.

Examples:

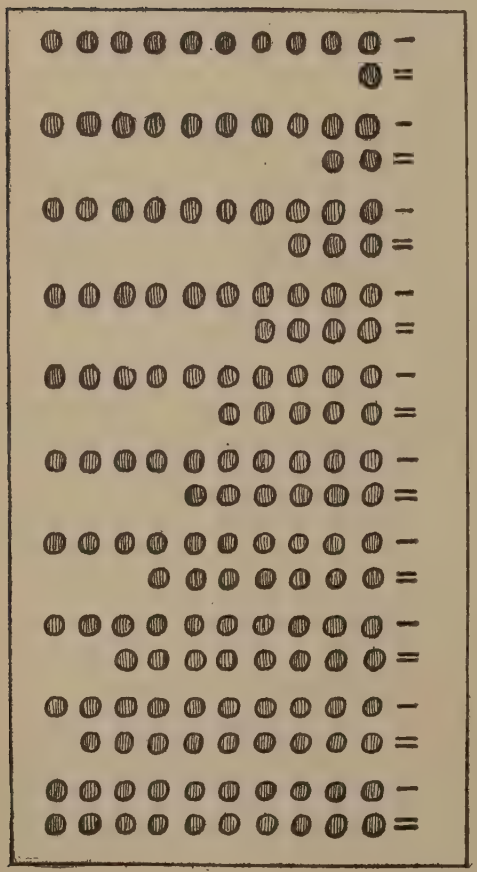
	38
38 and 5 is 43 and 40 is	45
83 and 3 is 86 and 70 is	73
	156

	225
225 and 2 is 227 and 60 is 287 and 800 is	862
1087 and 4 is 1091 and 20 is 1111 and 300 is	324
1411 and 5 is 1416 and 10 is 1426 and 400 is	415
	1826

Subtraction

SUBTRACTION.

- Definitions.
- Terms.
  - Remainder.
  - Minuend.
  - Subtrahend.
- Principles.
- Signs.
- Operation.
  - Like Numbers.
  - Grouping.
  - Subtracting.
  - Borrowing.
  - Remainder.
- Proof.
- Rules.

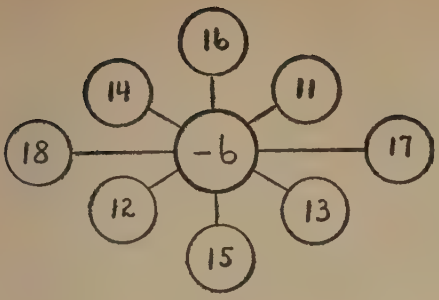


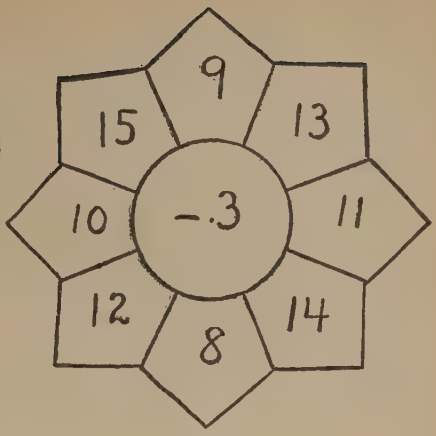
In a similar chart, under Addition, we show how interesting lessons can be made by using objects or pictures of objects instead of figures.

Rules and difficult terms and definitions should never be given to beginners, but when it is explained that subtraction is merely counting one number from another they are able to understand and remember the principles involved.

In the chart given the first two lines illustrate all subtractions in the table of ones, and by contrasting the chart on Addition with the one on subtraction, pupils will readily see the great difference in the operation.

After this chart has been thoroughly gone over the subtraction of figures will be an easy matter, as a glance at the chart will show that all the various subtractions up to 10 minus 10 are given.





The pupil that has taken the work in Addition in connection with the exercise here suggested can but appreciate the advantage of reciting the subtraction work in the same manner. The continual asking of questions by the teacher only creates confusion and occasions unnecessary noise, as the same results can be obtained by simply moving the pointer from one exercise to another. It begets order on the part of the pupil and not only makes the school work more effective but saves the teacher's breath for an occasion which demands it.

If this chart is before the class pupils may be called upon to recite as the teacher points to the different numbers on the outside row and pupils may recite in turn.

CHART EXERCISE.

The same scheme presented on the window roller with slated cloth, under Addition, can be used effectively with your beginning subtraction classes. Dozens of problems can be given which will include all the various subtractions. In the first few exercises we would give problems that would not require any borrowing and the other exercises can demonstrate this feature. The special advantage in having a chart of this kind is the saving of time on the part of the teacher in preparing the exercises every time she takes a class over such work. This temporary preparation is the thing that makes school work a burden to the teacher, and if these exercises can be put up in a permanent way so that they can be adapted for the various grades of work as reached, the teacher's work is not only effective but pleasant, and will proceed as clock work, thus giving a dignity which begets order and system. Carefully planned work, arranged for permanent use, is sure to yield better returns than hastily arranged, temporary work, and when prepared as suggested will not only give better returns but will eliminate the dust objection which results from the unnecessary use of the blackboard for such exercises.

10	11	14	8	10	9	8
4	7	8	7	2	5	2
12	13	11	6	9	12	7
3	5	6	2	4	6	3
7	11	9	12	8	6	7
2	8	3	7	3	2	5
6	9	13	10	8	9	12
5	7	7	3	4	6	5
11	5	10	12	15	13	14
5	2	6	6	7	6	8
10	8	14	11	13	16	15
2	6	9	7	8	9	6
12	14	16	15	13	14	16
9	6	8	9	4	7	7

The essential requirement for successful teaching of arithmetic is a constant drill on the fundamentals until the pupil masters the subject. We think if the teacher will prepare a chart as designed above and will have it in readiness that an opportunity will present itself frequently for its use. The pupils will especially appreciate drills of this kind, and the answers may be given in any direction without even using a pointer. The pupils may be called upon to recite rapidly and to continue until a mistake is made or the entire chart is covered. If the answers can be given readily to the problems here suggested, it will acquaint the pupil with subtraction and will be a drill which can be gone over profitably by many pupils considerably advanced in arithmetic. You can read from top to bottom, from bottom to top, from left to right and from right to left. In this practice, all that should be said or thought is simply the remainder.

DRILLS FOR WRITTEN WORK.

Write numbers that can be subtracted from 6 with remainders, as:

6—0=6
6—1=5
6—2=4
6—3=3
6—4=2
6—5=1

Write numbers that can be subtracted from 4 with remainders.
Write numbers that can be subtracted from 7 with remainders.
From 5 with remainders.
From 8 with remainders.
From 9 with remainders.

12— 6=6
12— 7=5
12— 8=4
12— 9=3
12—10=2
12—11=1
12—12=0

Make a table of numbers above 7 which can be subtracted from 15 with remainders.

Of numbers above 8, from 16, with remainders.
Of numbers above 5, from 14, with remainders.
Of numbers above 9, from 17, with remainders.
Subtract by 3's from 21. From 35 to 20.
By 2's from 20.
By 2's from 27.
By 4's from 36. From 23 to 3.
By 5's from 50. From 31 to 1.
By 6's from 54. From 38 to 2.

These drills will fix definitely in the pupils' minds that subtraction is counting one number from another and is, therefore, the opposite of addition.

PRINCIPLES IN SUBTRACTION.

I. Only like numbers, and units of the same order, can be subtracted.
II. The remainder is always like the minuend and subtrahend.

PROOFS OF SUBTRACTION.

I. The sum of the subtrahend and remainder should equal the minuend.
II. Subtract the remainder from the minuend, and the difference should equal the subtrahend.

NO CARRYING.

Practice is necessary, and problems easily understood are the most interesting drill to the pupil. For this reason it is well to give many problems requiring no "carrying," that he may become thoroughly familiar with the tables.

CARRYING.

If one step is learned at a time, confusion will be avoided. Master the tables before introducing the "carrying" process. A little at a time, mastered, results in interest, application and acquirement.

MULTIPLICATION.

- Definitions.
  - Multiplication.
  - Multiplier.
  - Multiplicand.
  - Product.
- Terms.
  - Factor.
  - Multiple.
  - Power.
  - Exponent.
  - Square.
  - Cube.
- Signs.
  - Meaning.
  - Name.
- Principles.
- Operations.
  - Written.
  - Partial products.
  - Proper position.
  - Adding.
  - Contractions.
- Proof.
- Examples.
- Tables.

The preliminary work in addition and subtraction fits the pupil for work in multiplication. As he learned the forty-five facts in addition and the various combinations in subtraction, he must now learn the multiplication tables.

A thorough knowledge of these tables is absolutely necessary. There are only a very few of these multiplications that give the pupils trouble, and these parts should be given especial attention.

Devices should be introduced so that the drills will not become monotonous.

SHORT WAY OF ADDING.

Show this principle by means of small numbers and make the applications to larger ones, and the value of multiplication is apparent.

PRACTICE.

Give many problems with small numbers until the pupil is thoroughly familiar with the idea. Problems within the understanding of the pupil are solved with delight and enable the pupil to familiarize himself with the tables without connecting the effort with the feeling of drudgery.

Multiplication Table.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

A very simple way of showing multiplication tables up to 12 is reproduced in the above illustration, and for the beginning pupil it might be well for him to have a card before him with such exercises thereon. It will serve to acquaint him with the results and will save time and wear on the book in turning back to the tables.

The teacher may insist that she does not believe in having the pupil refer to the tables, but such an argument can be offset by simply referring to the pupil's arithmetic and notice how readily it will open to the pages containing these tables and the worn appearance of this page. Our suggestion, however, is to use this card only temporarily until the combinations are all fixed in the mind to use it persistently in acquiring this information so that the pupils will not need to hold one finger on the multiplication table while they solve the problems in cube root.

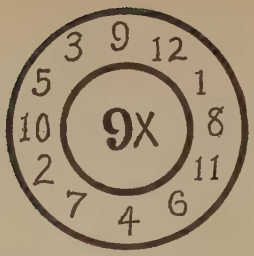
Exercises

We give below a few suggestive exercises to be used in connection with the study of the multiplication tables.

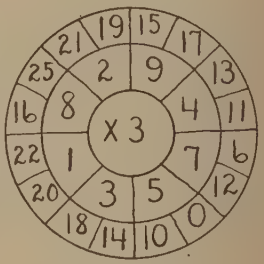
Have pupils prepare lists of the factors whose product will equal a given number, as

$2 \times 12 = 24$
$3 \times 8 = 24$
$4 \times 6 = 24$
$6 \times 4 = 24$
$8 \times 3 = 24$
$12 \times 2 = 24$

Have the class make a table of factors whose product is 60.
Whose product is 36. 72. 20.



The teacher can drill the pupils effectively on the tables by simply using the pointer, and a chart of this kind should be used in connection with every table. The essential thing in the mastery of these tables is drill, drill, drill.



REVIEW.

We give here illustrations of three diagrams to be used in connection with oral recitations on Addition, Subtraction and Multiplication. Should the pupils become familiar with the combinations the numbers can be easily changed and new combinations formed.

The figure in the center is combined with any number as indicated by the teacher, the answers being given orally and as rapidly as possible by the class.

Such exercises frequently given will aid the pupil in recognizing such combinations of figures at sight.

SHORT CUTS.

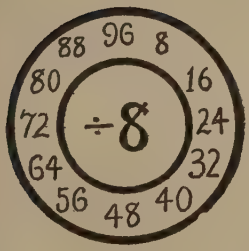
The introduction of short cuts in multiplication before the pupil thoroughly masters the tables and understands the principles involved, should be avoided, but it would be equally unwise later not to make use of this means for the saving of labor and the acquirement of rapidity.

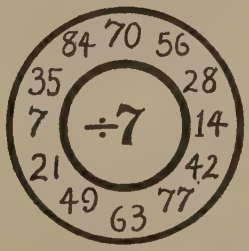
A thorough drill in the aliquot parts of 100 and 1,000 and the simple rules for multiplying by 9 or any number of 9's, the multiplying by 11, and other like rules, should be understood by the student in their application to multiplication.

Division

DIVISION

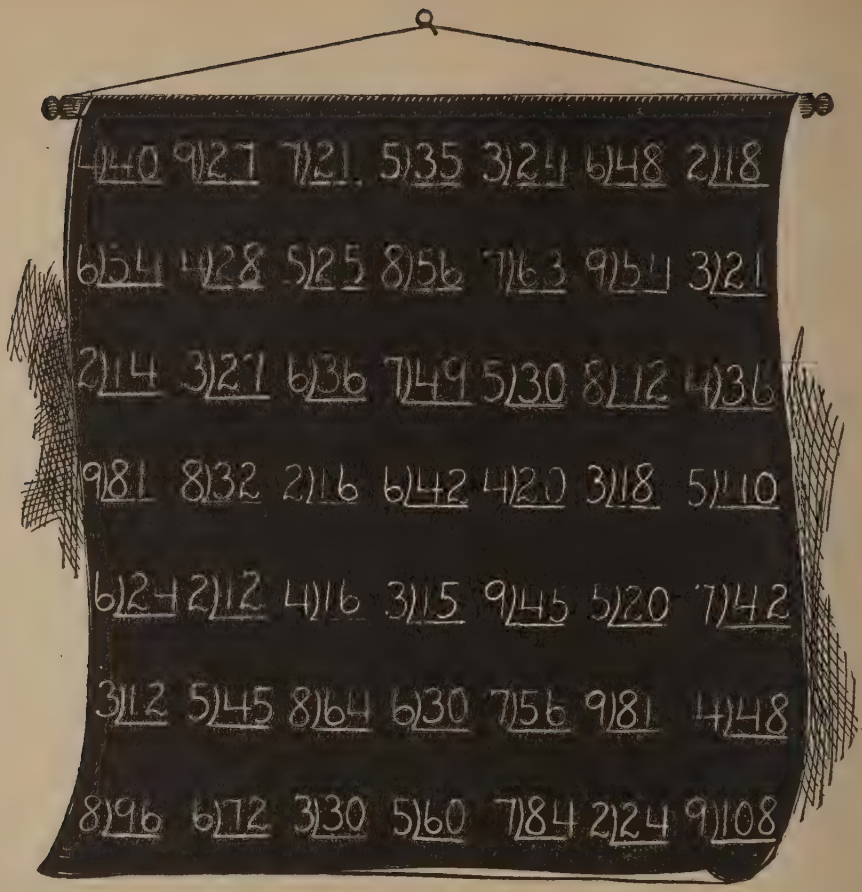
- Terms.
  - Dividend.
  - Divisor.
  - Quotient.
  - Remainder.
  - Prime Numbers.
  - Factors.
- Signs.
- Short Division.
  - Methods.
  - Rules.
- Long Division.
  - Definition.
  - Process.
  - Proof.
  - Rules.
- Factors.
  - Reduction.
  - Operation.
  - Rules.
- Cancellation.
  - Definition.
  - Method.
  - Signs.
  - Analysis.
  - Rule.
- Principles.
- Rules.
- Examples.





The teacher can use this drill in the same manner as those shown before. Various designs have been shown to lend variety to the exercise. The usual method of using the drill is by pointing to any number in the outside circle, asking the pupils to name the quotients for all the numbers involved in the drill, moving either to the right or left. Change the center number for each exercise.

Allow no "thinking out" results. The table must be at the tongue's end. Again, impress the importance of accuracy. A wrong result is worse than no result. The essential thing is to think quickly and to tell correctly.



A very interesting exercise can be had from a chart prepared as suggested in the illustration. In each of these exercises division is exact. We have prepared another chart on the following page which will show a remainder in the quotient. Of course, it is a very easy matter for these charts to be reproduced on the blackboard for temporary use, but as has been suggested, they will prove of so much value for reference and for ready class work that if the teacher can prepare permanent charts of this kind it will not only be a relief but will be used often when time will not permit the elaboration of such material on the blackboard and the confusion of the preparation and annoyance of the dust can be eliminated. Accuracy and rapidity in division are determined largely by the pupil's ability to give quotients at sight, and if this exercise is frequently used it will prove fascinating and educational.

6|16 3|17 5|29 7|18 4|13 9|21 8|31

2|25 5|22 9|87 4|23 6|58 3|20 7|30

4|33 7|37 3|28 8|36 9|40 2|33 5|43

7|44 9|55 8|85 3|17 5|37 4|46 6|41

9|91 4|26 6|15 5|49 8|52 7|60 3|28

5|67 8|79 4|47 9|66 7|83 6|57 4|49

8|76 2|31 7|74 6|68 3|35 5|62 9|75

For recitation have the pupil's announce at sight quotients and remainders.

The division on these two pages is done mentally, and the process is called short division.

Drudgery is to be avoided in school work. In all our various exercises the idea is to repeat the tables over and over again, and the object in having a great variety of these exercises is to give a pleasing nature to the work.

At no time are we sure that the pupil remembers the work previously recited, and for this reason it is necessary to review constantly, as well as to drill. A gradual growth, avoiding confusion, and repetition of past principals until thorough in their application, is necessary at every step.

SOME ORAL EXERCISES IN DIVISION.

How many feet in 60 inches?
24 inches?
96 inches?
44 inches?
52 inches?
120 inches?

How many quarts in 16 pints?
22 pints?
30 pints?
36 pints?
48 pints?
28 pints?

How many weeks in 49 days?
63 days?
35 days?
42 days?
56 days?
84 days?

How many quarters in $1.50?
.75?
2.25?
3.00?
1.25?
2.75?

What is 2-7ths of 49?
21?
63?
35?
56?
84?

What is 3-5ths of 30?
45?
15?
55?
25?
60?

How many nickels in 65 cents?
40 cents?
35 cents?
60 cents?
75 cents?
45 cents?

How many yards in 15 feet?
20 feet?
33 feet?
27 feet?
36 feet?
21 feet?

How many dozen in 60?
84?
72?
108?
96?
48?

How many dimes in $1.20?
.60?
3.00?
2.50?
.70?
1.00?

What is 5-8ths of 16?
40?
32?
48?
24?
64?

What is 4-9ths of 36?
27?
45?
72?
18?

LONG DIVISION.

Long division differs from short division simply in writing the products instead of performing the operation mentally.

A careful drill on easy problems will enable the student to familiarize himself with the process, and the introduction, step by step, of each new feature, will be easily effected.

EXERCISES.

Any number ending with an even digit is divisible by 2.

Any number is divisible by 4 when the number expressed by the last two figures is divisible by 4.

Any number ending in 0 or 5 is divisible by 5.

Any number is divisible by 3 when the sum of its digits is divisible by 3.

Fractions

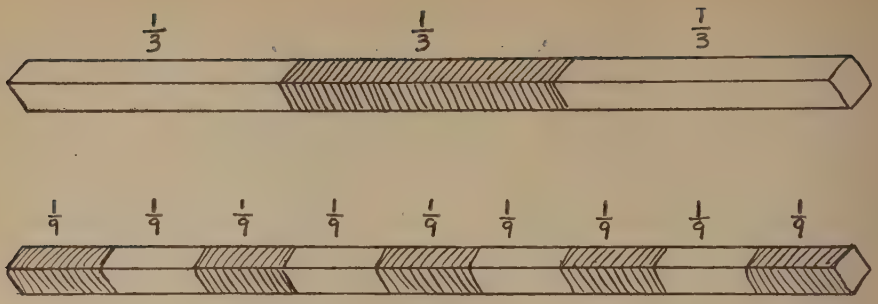
FRACTIONS.

- Kinds.
  - Common.
  - Decimal.
- Forms.
  - Simple.
  - Compound.
  - Complex.
- Value.
  - Proper.
  - Improper.
  - Mixed.
- Terms.
  - Numerator.
  - Denominator.
  - Integers.
  - Prime.
  - Composite.
  - Least Common Multiple.
  - Greatest Common Divisor.
- Operation.
  - Addition.
  - Subtraction.
  - Multiplication.
  - Division.
  - Ratio.
  - Reduction.
- General Principles.
- Rules.
- Examples.

By the use of objects pupils will readily grasp the idea of halves and thirds and by careful presentation they will see that 1/3 is smaller than 1/2. After these relations have been developed in the child's mind it is quite another thing to teach him the expression of these parts with figures and the mathematical combinations. This should be developed gradually. No guessing results should be permitted; no special emphasis laid upon rules, but a careful expression of the known in the symbols of the unknown.

Quite a few suggestive exercises have been shown and suggestive drills given With such help and the use of objects, pupils should not only learn to get answers but to understand the subject fully.

We stated in the study of the fundamental operations that a thorough understanding of them would enable the pupil to handle the more advanced operations successfully, and it is now opportune to emphasize the necessity of a thorough understanding of fractions in order to hope to be efficient in the understanding of percentage and the subjects to follow.



The above illustration can be used in developing the fractions 1/3 and 1/9 and shows, at the same time, their relative value to the whole number and to each other.

We give a few exercises of the many which can be developed by this device:

1/3 is equal to how many 9ths?
2/3 equals how many 9ths?
1/3+1/9 equals how many 9ths?
2/3 is how many more than 5/9?
Which is greater, 4/9 or 1/3?
2/3+7/9= how many 9ths?
6/9= how many 3rds?

6 5/9	26 8/9	6 1/3	30	14 2/9
1 1/3	— 7 2/3	2 2/9	— 7 4/5	6 2/3
		1 4/9		

RULES FOR REDUCTION OF FRACTIONS.

We give below a few rules in the reduction of fractions:

When both the denominator and the numerator are multiplied by the same number, the value of the fraction does not change.

When both the numerator and denominator are divided by the same number the value of the fraction does not change.

When both numerator and denominator are numbers which are prime to each other the fraction is reduced to its lowest terms.

Fractions are reduced to their lowest terms by dividing both numerator and denominator by their greatest common divisor.

Fractions are changed to higher terms by multiplying both numerator and denominator by the same number.

An improper fraction is reduced by dividing the numerator by the denominator.

In expressing fractions the essential thing is to have the child understand that there are two questions presented, and to determine which part of the fraction answers each.

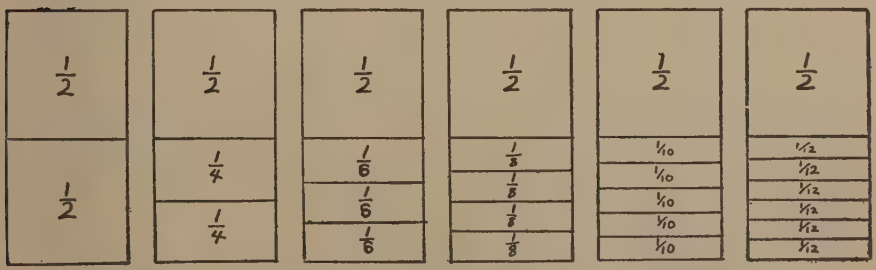
1. How large are the parts?
2. How many parts are taken?

Pupils may readily be impressed with the comparative size of the different fractions by exercises as suggested above. They can easily see that there are two halves in one; that it takes 4/4 to equal one and 8/8 and 16/16. Since the teacher understands these facts she should not pass over them too rapidly, but many easy exercises may be developed, showing just how many 16ths in 1/8, in 1/4, in 1/2.

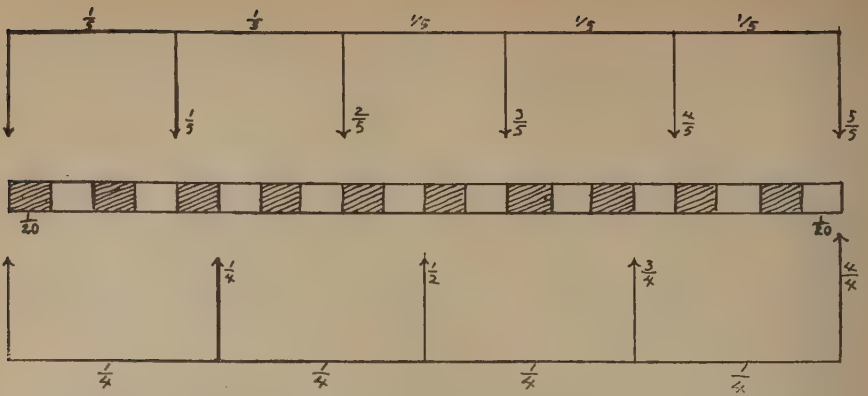
How many 8ths in 1/4? In 1/2?
How many 4ths in 1/2?
Various other questions may be asked, such as
How much larger is 1/2 than 1/4?
How much larger is 1/4 than 1/6?
How much larger is 3/4 than 5/8? 3/8?
3/8 is equal to how many 16ths?
6/16 is how much larger than 1/4?
3/16 is contained in 6/8 how many times?

EASY EXERCISES.

1/2 +1/4	1/4 —1/8	1 1/8 +2 1/4	1/2 —3/8	5 1/4 +2 5/8
7 1/2 —3 1/4	5/8 +1/4	3 1/16 —1 3/8	3/16 +5/8	4 3/4 +1 1/8
6 3/8 +2 5/16	9 1/2 —5 3/4	3 7/8 +1 13/16	15/16 +1/4	3 5/16 —1 7/4
27 +3 7/8	34 7 11/16	57 5/8 —4 6/16	23 3/8 9 1/4	21 3/4 —14 1/2



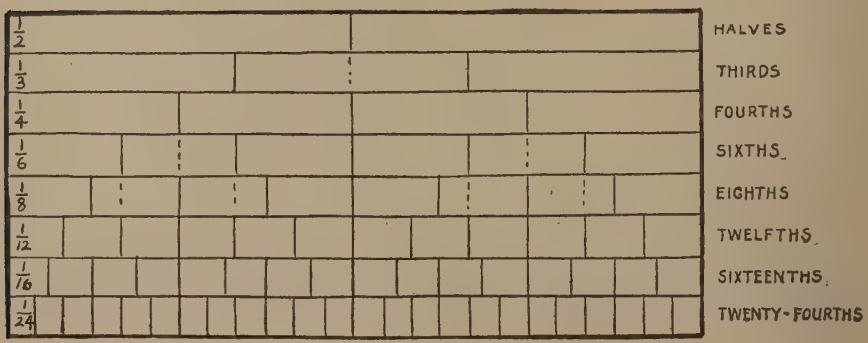
Have fourths compared with thirds, eighths, tenths and twelfths.
Story problems should be used freely to illustrate and make plain.
Every step should be illustrated with objects or drawings. Cardboard disks can be easily supplied.



The above diagram is divided into 20ths and will be found useful in teaching fractions and reduction. We give the following suggestive examples and the teacher can develop any number of similar exercises.

1/5 equals how many 20ths?
1/2 equals how many 20ths?
How many 5ths in 16/20?
3/5 equals how many 20ths?
1/4 equals how many 20ths?
1/5 equals how many 20ths?
1/4 is how much larger than 1/5?
1/2 is how many 20ths?
3/5 is how many 20ths?
How many more 20ths in 3/5 than in 1/2?
Which is greater, 4/5 or 3/4? How much?
Since 5 is larger than 4, why is not 1/5 larger than 1/4?

6 2/5	9 1/4	20 4/5	39	6 1/2
—4 1/2	—6 3/5	—7 1/4	—8 2/5	—3 3/4
14 1/5	7 9/20	13 3/5	16 3/4	1 17/20
—7 3/4	—4 3/4	—6 7/20	—3 4/5	—3/4



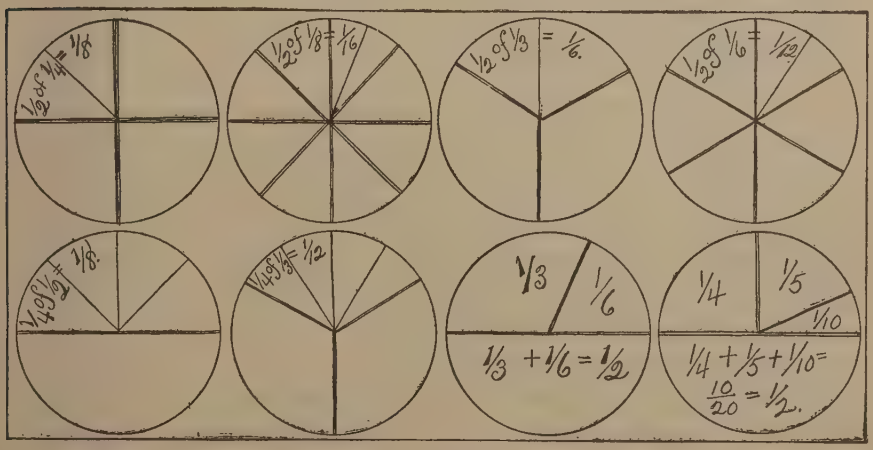
The illustration given below gives the different stages in the reduction of fractions. This enables the pupil to tell at a glance how many twenty-fourths are equal to one-eighth; the number of sixteenths in one-half, etc., and from closer study fix definitely the relative size and value of the fractions contained in the unit or whole number.

We suggest, in connection with this illustration, that the teacher write exercises on the board reducing to lowest terms such fractions as

72/128 63/90 96/144 90/105

Many examples can be made from this diagram comparing in size the different fractions found in it. We give a few to illustrate:

Change 3/6 to 8ths. 1/2 to 16ths.
Change 6/24 to 8ths.
What is 16 times the difference between 3/16 and 3/6?
What is 24 times the sum of 5/6 and 3/4?
What is 1/2 of 5/6?
What is the comparative value of 5/8 and 15/24?
How many 6ths in 1/2?
How many 16ths in 1/4?
How many 16ths in 5/8?
How many 24ths in 2/3?
How many 4ths in 9/12?
How many 3rds in 16/24?
1/2 is how much larger than 3/8?
2/3 is how much larger than 1/6?
5/6 is how much larger than 1/3?
How many 12ths in 1/3?
How many 24ths in 3/16?
How many 8ths in 3/4?
How many 16ths in 1/2?
How many 6ths in 8/12?
How many 16ths in 3/4?
5/8 is how much larger than 6/16?
3/4 is how much larger than 10/24?
1/4 is how much larger than 3/16?



- DECIMALS.
  - Decimal Fractions.
    - Classes.
      - Pure.
      - Mixed.
      - Complex.
    - Operations.
      - Reduction.
      - Decimal point.
      - Addition.
      - Subtraction.
      - Multiplication.
      - Division.
      - Cancellation.
  - Percentage.
    - Fractional.
    - Equivalent.
    - Signs.
    - Value.
  - Circulating Decimals.
    - Definition.
    - Principles.
    - Reduction.
    - Operations.
  - General Rules.
  - Examples.

DECIMALS.

What has already been said in connection with the thorough understanding of the preceding departments of arithmetic should be again emphasized in the study of decimal fractions. We will content ourselves with an outline on this subject and by calling attention to an exercise in the development of the division of decimals, leaving to the pupil the development of the other subjects in decimals from the text book.

DIVISION OF DECIMALS.

It is foreign to the subject for a teacher, presenting division of decimals, to give lengthy problems in simple division. The one thing we learn at this time is to point the result correctly. So soon as the pupil has been drilled on the principles and solved the problems contained in the arithmetic, a simple exercise as suggested below will show very quickly whether the pupil understands thoroughly the "point" in question. A glance at the suggestive chart will show you that no technical division is required as the answer is merely 1 with the cipher prefixed or annexed. If your first thought is that the exercise is too simple for the pupils in your class we suggest that you submit it to them and you will be surprised at the result. Even your classes farther over in arithmetic will be confused with this exercise and many of them will not make over 50 per cent if given but a few minutes in which to make the division.

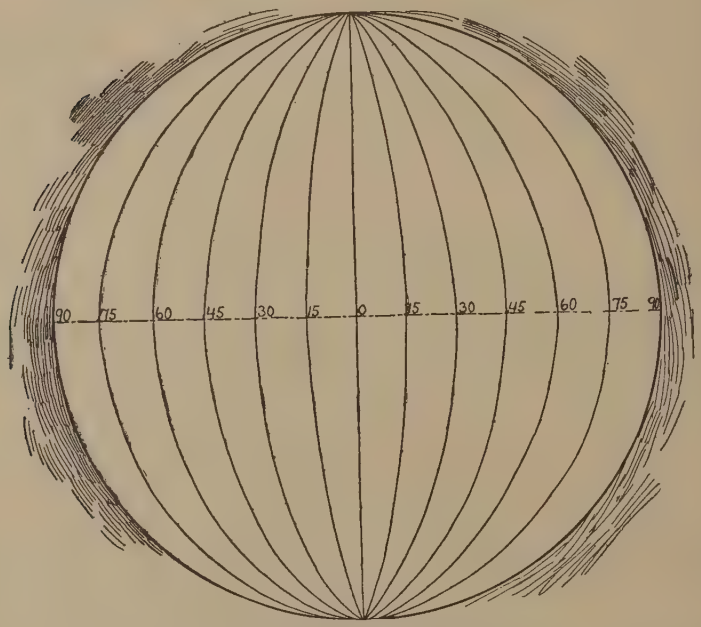
Teachers should be supplied with some sort of a duplicating machine, as they can be secured at a nominal price. A sufficient number of copies of this exercise can be prepared for class use. The teacher should prepare the answers before class time. The pupils should exchange papers and grade them while the teacher reads the answers. The entire exercise need not take ten minutes and will prove an eye opener to the class. We call especial attention to the fact that no two of the problems are exactly alike.

3)003	300)30	30)300	3)3
.03)3	3)300	300)3	.03)30
.003)300	30)3	.3)30	300)300
3)3	.3)03	.003)003	.03)3
30)30	.03)003	.003)3	003)30
300)03	.3)3	.03)03	30)003
.3)3	3)03	.300)3	003)3
.003)03	30)3	300)003	.03)300
3)003	.3)300	3)30	30)03

Longitude and Time

LONGITUDE AND TIME.

- Definitions.
  - Longitude. — How reckoned? / How measured?
  - Latitude.
- Signs.
  - Number.
  - Meaning.
- Operation.
  - Method.
  - Rules.
  - Principles.
- Examples.



LONGITUDE AND TIME.

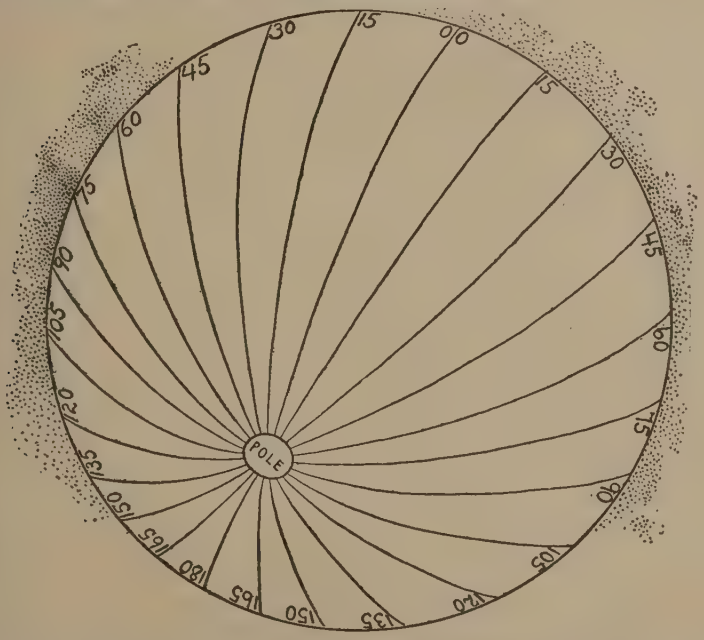
No teacher should attempt to explain Longitude and Time to the pupil without a diagram representing a hemisphere, and better than the ordinary representation of the hemisphere, would be a diagram showing the northern or southern hemispheres so that the entire circuit of the globe can be illustrated, thus showing the 360 degrees; and from this diagram it would be an easy matter for the teacher to develop the subject of Longitude and Time and the changing of the one to the other.

Since the degrees encircling the globe are 360 and the time it takes the earth to rotate on its axis is 24 hours, the simple division of 360 by 24 will

impress the pupil that every hour of time is equal to 15 degrees of longitude and since the divisions of the hours and longitude correspond in number and name we think any pupil will readily grasp the idea that to change longitude to time only necessitates a process of division, and to change time to longitude the reverse operation.

With the diagram above we suggest that the pupil be drilled thoroughly in the mental reduction of the one to the other. We have made this representation very simple since every meridian represents one hour of time and 15° of longitude.

A very few minutes' drill will enable the pupil to reduce to time the distance between 15° West longitude and 45° West longitude. This can be continued until you have made the half circuit of the globe. We should then reverse the operation by taking 15° West longitude and 15° East longitude and noting that it is necessary to add in order to find the difference in degrees, while in the previous problems it was a process of subtraction. We can then change the problem from 30° West longitude to 30° East longitude, continuing the addition process until the principle that East and West longitude must be added in order to find the difference is definitely fixed in the pupil's mind.



A degree of latitude in the Polar regions is about 69.3 miles in length, in middle latitudes about 69 miles and at the equator is 68.72 miles.

A degree of longitude is 69.16 miles long at the equator; 65 miles long on the 20th parallel; about 53 on the 40th; about 35 miles on the 60th and about 12 miles on the 80th.

Most countries have their own prime meridian of longitude; the one for the United States passing through Washington, while that of England passes through Greenwich. Longitude is generally reckoned from Greenwich, each degree of longitude being 1/360 of the earth's circumference.

The rotation of the earth once in twenty-four hours causes a difference in time of 4 minutes for each degree.

In Solar time there is a difference of 4 minutes for every degree east or west.

Eastern time in the United States is the sun time for the meridian 75 degrees west of Greenwich; Central time 90 degrees; Mountain time 105 degrees and Western or Pacific time 120 degrees. The time is one hour later for each belt from east to west.

The 180th meridian or International Date Line as it is called, is the line from which the day begins and the length of time taken by the sun to again reach that point constitutes a day.

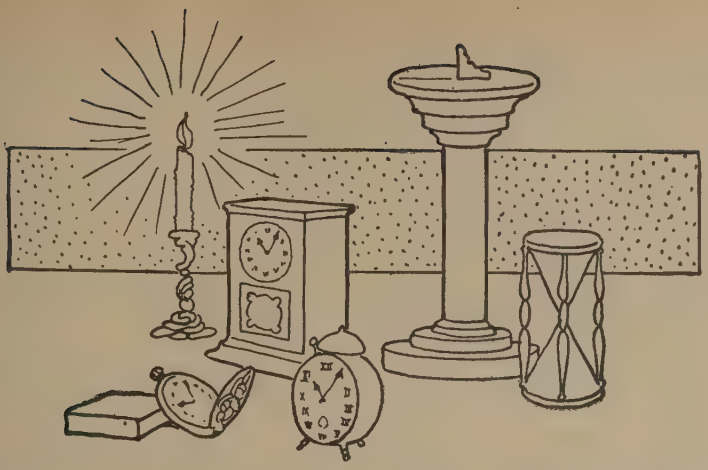
The day begins earlier as you travel east until the 180th meridian is reached and as you travel west an hour is gained for each time belt. Thus, in a journey around the world, from east to west, one day is gained and from west to east one day is lost.

The unit of time is one day. Our illustration shows various methods of measuring time and will prove an interesting and useful study for the beginning of the work in this department.

Time measure not only applies to the day and its divisions, but is used in the study of interest and in longitude and time.

The business month is ordinarily figured at 30 days and the business year at 360 days.

A solar year contains 365 days, 5 hours, 48 minutes and 51.6 seconds. All years divisible by 4 are called leap years, except centuries, which must be divisible by 400.



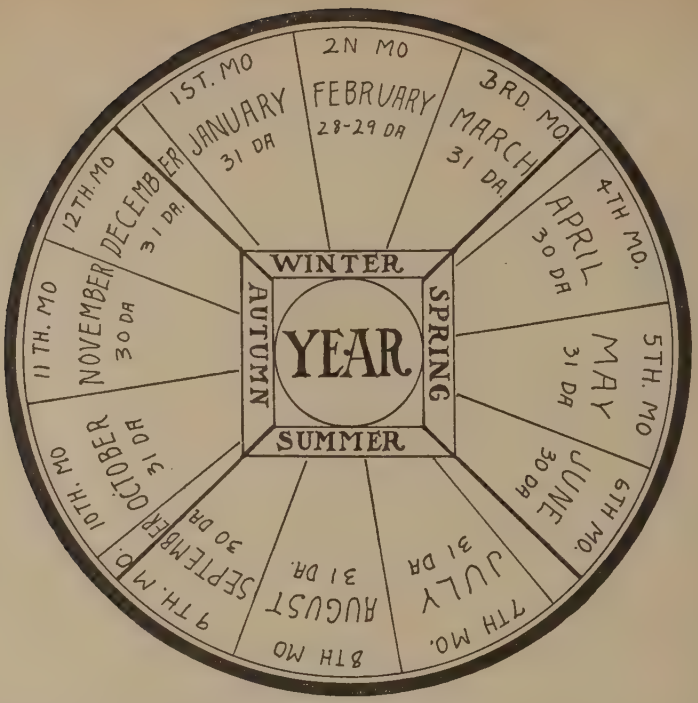
Calendars are so common that every child is familiar with them and can readily become interested in the study of them. In addition to this it is common now in primary schools for the teacher to have the calendar for the current month displayed on the blackboard. By making use of these means the pupil will readily become familiar with the days of the week, the months of the year and with the number of days in each month.

Various exercises can be conducted that will not only create an interest for the pupil but will be profitable as well. Pupils will be interested in finding out on what day of the week the next Fourth of July will occur or their respective birthdays, holidays, etc. The pupils should be led to distinguish between the day of the week and the day of the month and with the use of the diagrams shown they can readily acquaint themselves with the seasons, quarters, etc.

A FEW SUGGESTIVE EXERCISES.

How many weeks in a year?
How many days in a week? Name them in their order.
How many months in a year? Name them in their order.
How many months have 31 days?
On what day of the week does Decoration Day fall this year?
Is 27 days longer than 4 weeks?
Which is nearer the exact length of a month, 4 weeks or 5 weeks?
How many days in two weeks?
On what day of the week will your next birthday occur?

Remembering the addends of 7 and the day of the week for the first of the month, one can readily locate the present day of the month. This will be of much help to you and will frequently enable you to give the day of the month when you would otherwise be unable to do so. We are nearly always able to determine whether this is the second, third or fourth week of the month, knowing approximately the date. If we remember that the first day of the month was Monday and it is now Tuesday about the last of the month, we only need to repeat 8—15—22—29, and we know that Monday was the 29th and that today would be the 30th.



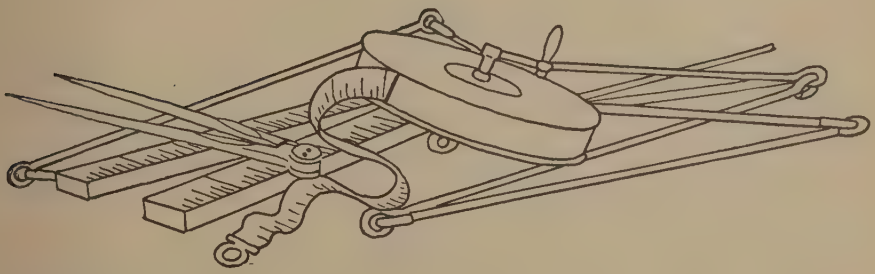
GREGORIAN CALENDAR.

The first division of time resulted from the changes of the moon, suggesting the months, and the movement of the sun and regular recurrence of the seasons, into years. The division into weeks was based on the Laws of Moses, setting forth every seventh day as a day of rest.

The Egyptians, the Jews, the Greeks and the Romans all had different systems of determining the seasons. The original calendar of the Romans was first remedied by Julius Cæsar and later Pope Gregory XIII reformed the Julian Calendar, making all years divisible by four leap years, with the exception of new centuries, not divisible by 400, as 1700, 1800, 1900, which, with all other years not divisible by four, are called common years.

ORIGIN OF NAMES OF MONTHS.

January	Janus	The god of the year.
February	Februa	Roman festival of expiation.
March	Mars	God of war.
April	Aperire (to open)	Budding month.
May	Maia	Daughter of Atlas.
June	Juno	Sister and wife of Jupiter.
July	Julius	In honor of Julius Cæsar.
August	Augustus	In honor of Augustus Cæsar.
September	Septem	Seventh month.
October	Octo	Eighth month.
November	Novem	Ninth month.
December	Decem	Tenth Month.



Surveyors and engineers usually measure with steel tapes generally 100 feet long, divided into feet and fractions of a foot.

A hand, used in measuring a horse at the shoulder, is equal to 4 inches. A span is equal to 9 inches.

A Gunter's Chain is 4 rods or 66 feet long and consists of 100 links.

A knot is equal to 1.15 common miles and is used in measuring distance at sea.

A square for measuring floors is equal to 100 square feet.

In order to survey a piece of ground it is first necessary to find some corner stick or rock from which to start. This being found, the line is then run according to an official chart until the particular subdivision is located.

The United States land measure, which is the same as that of England, is 4,840 square yards to an acre.

A Scotch acre is equal to 6,150 square yards; an Irish acre to 7,840 square yards; a French acre is equal to 11,960 square yards and an acre in Prussia is equal to 3,053 square yards.

To find the number of acres in a rectangular piece of land, multiply the length in rods by the breadth in rods and divide by 160.

To find the number of square rods in a triangular piece of land, if right-angled, multiply the width by the length and divide by 2.

To find what fractional part of an acre is contained in a town lot, multiply the length in feet by the width in feet and divide by 43,560.

1/8 of an acre equals a square of land 73 3/4 feet each way.
1/4 of an acre equals a square of land 104 3/8 feet each way.
1/3 of an acre equals a square of land 120 1/2 feet each way.
1/2 of an acre equals a square of land 147 1/2 feet each way.
1 acre equals a square of land 208 7/10 feet each way.

Dry measure is used in weighing such articles as grains, fruits and all articles not liquid.

Before weighing scales became common it was customary to use measures for this purpose.

Dry measure weights of different commodities are fixed by law in most of the states. A table for reference can be prepared and pupils should learn the weights used in their own state.

One bushel of grain is equal to 2,150.42 cubic inches.

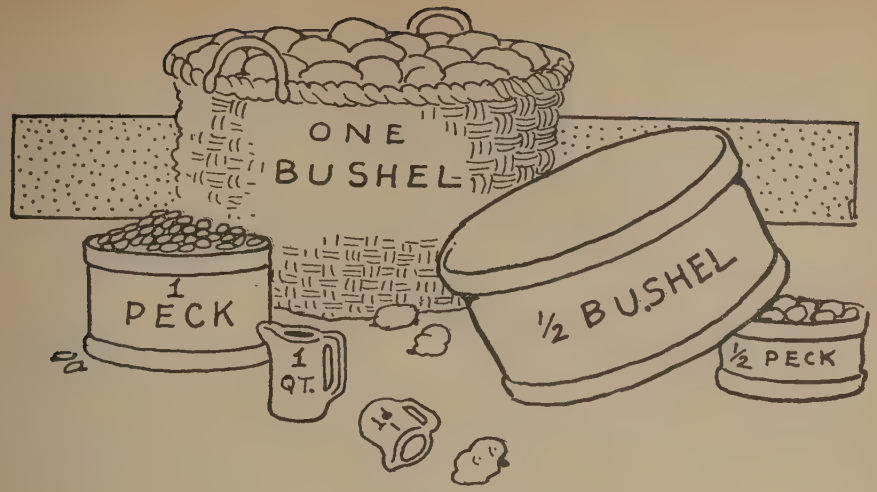
One bushel of vegetables is equal to 2,688 cubic inches.

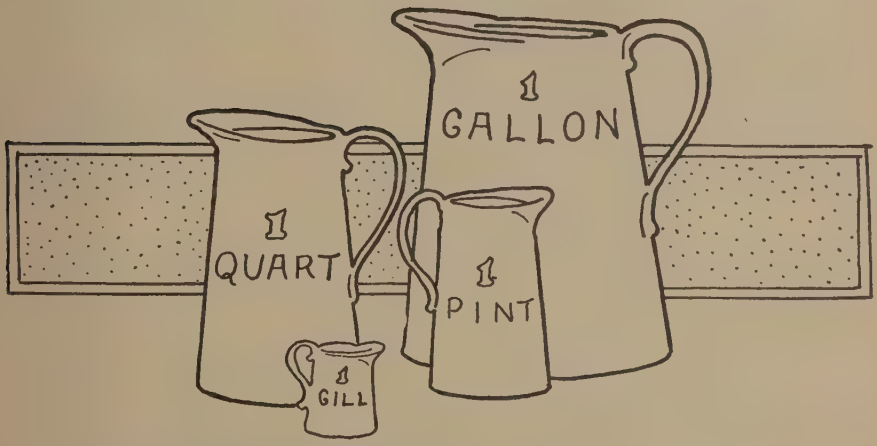
The legal bushel of the United States is the Winchester measure of 2,150.42 cubic inches, while that of England is 2,218.142 cubic inches, so that 32 English bushels are equal to about 33 of ours.

The number of pounds to a bushel varies in different states, some states measuring heaping bushels, which contain 2,815 cubic inches.

Wheat, beans and potatoes weigh about 60 pounds to the bushel; shelled corn 56; oats 35 pounds; rye and flaxseed 56 pounds; corn on the cob 70 pounds, and buckwheat 52 pounds.

A bushel of corn means a bushel of shelled corn or ear corn enough to make a bushel when shelled.

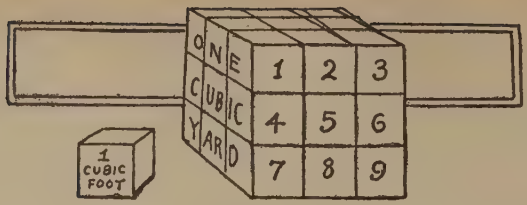




One gallon is equal to 231 cubic inches.
One cubic foot of water is equal to 62 1/2 pounds.
A teacup holds about 4 fluid ounces.
A tablespoon holds about 1/2 a fluid ounce.
A teaspoon holds about 1 fluid dram.

In taking up liquid measure, it is an excellent plan to have gill, pint, quart and gallon measures, where possible, and teach by actual demonstration in connection with the tables.

Commence with the gill and let the pupils see how many gills it will require to fill a pint measure, continuing in like manner with the other measures and at the close of the recitation have the pupils make a list or table from memory, based on the facts learned from observation. Have the children tell how many liquids they know of which are measured in this way.



CUBIC MEASURE.

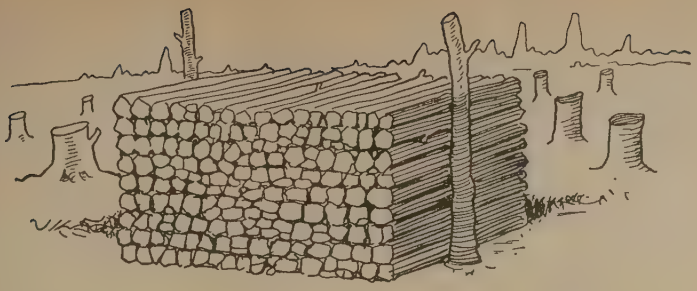
Every solid must have length, breadth and thickness. The use of objects is necessary for the successful understanding of this subject and should be constantly used to make every step clear. If the pupils have already made a thorough study of fractions and decimals, little attention need be paid to the mechanical operations involved. It is absolutely necessary for the pupil to commit tables and definitions, but this would be found a much more easy accomplishment by the use of diagrams like the one given above, which will readily illustrate the number of cubic feet in a yard and if objects and diagrams are freely used, the tables will be readily acquired and indelibly impressed on the mind.

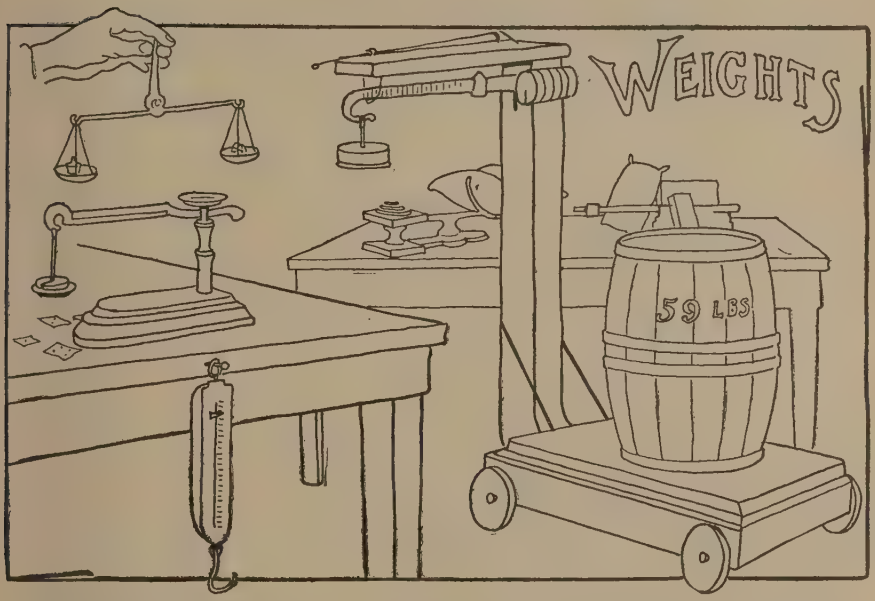
To find the number of cubic feet in a log, multiply 1/4 of the average circumference by itself and multiply the product obtained by the length, which will give the contents in cubic feet.

To find the number of cords of wood contained in a pile, multiply the length in feet by the height in feet and then by the width in feet and divide the result by 128.

A cord of stone will make approximately 100 cubic feet of wall.

Three bushels of lime and one cubic yard of sand will lay a cord of stone.





Distilled water is the unit by which the standard of weight is determined.

A long ton, which is used in weighing coal and merchandise in large quantities, is equal to 2,240 pounds.

One pound Avoirdupois weight equals 7,000 grains.

One pound Troy weight equals 5,760 grains.

A carat is used in weighing diamonds and is equal to 3 1/5 grains Troy weight.

The fineness of gold is also determined by the carat, the standard purity being .9 pure to .1 alloy, the alloy being of pure copper.

A firkin of butter weighs 56 pounds.

A barrel of flour weighs 196 pounds.

A barrel of beef or pork weighs 200 pounds.

A barrel of salt weighs 280 pounds.

A cask of lime weighs 240 pounds.

A keg of nails weighs 100 pounds.

A pint of water weighs about 1 pound.

Percentage

If the pupil has mastered the fundamentals and understands thoroughly common and decimal fractions it should be little trouble for him to take another step into percentage. It should not be presented as something vague, but a natural and simple relation of numbers expressed in so many hundredths and connecting with his previous work in fractions in such a way as to be readily understood.

TABLE OF EQUIVALENTS.

Symbol.	Written.	Decimal.	Common Fraction.
2 %=	2 per cent=	.02 =	2/100=1/50
4 %=	4 per cent=	.04 =	4/100=1/25
5 %=	5 per cent=	.05 =	5/100=1/20
10 %=	10 per cent=	.10 =	10/100=1/10
11 1/9%=	11 1/9 per cent=	.11 1/9=	100/900=1/9
12 1/2%=	12 1/2 per cent=	.12 1/2=	25/200=1/8
14 2/7%=	14 2/7 per cent=	.14 2/7=	100/700=1/7
16 2/3%=	16 2/3 per cent=	.16 2/3=	50/300=1/6
20 %=	20 per cent=	.20 =	20/100=1/5
25 %=	25 per cent=	.25 =	25/100=1/4
33 1/3%=	33 1/3 per cent=	.33 1/3=	100/300=1/3
50 %=	50 per cent=	.50 =	50/100=1/2

PERCENTAGE.

There are three kinds of problems in percentage:

1. To find the per cent of a number.
2. To find what per cent one number is of another.
3. To find a number when any per cent of it is given.

1. To find the per cent of a number such as 16 2/3% of 54, reduce the given rate of per cent to its equivalent common fraction (1/6) and divide the number by this fraction as—1/6 of 54 equals 9.

2. To find what per cent one number is of another, find what fractional part the percentage is of the number and reduce this fraction to its equivalent per cent, as—

What per cent of 300 is 50?

50 equals 1/6 of 300: 1/6 equals 16 2/3%

Or you can find 1% of the number and divide by the percentage, as—1% of 300 is 3. 50÷3 equals 16 2/3%.

3. To find a number when any per cent of it is given, find the equivalent value of the fraction and multiply by the denominator of the fraction, as—

Of what number is 630, 12 1/2%?

12 1/2%=1/8: 630×8=5040.

Or find what fractional part of the number is given, as—
1% of the number is 630÷12 1/2 or 50.4. 100% will be 50.4×100 or 5040.
Or divide the given number by the number denoting the rate of per cent, as—
450 is 10% less than what number?
450=90% of the required number. 1%=450÷90 or 5. 100% will equal 500.

	A	B	C	D	E	F
	3	74	13	8	.05	$21\frac{3}{4}$
I	$\frac{1}{2}$	.50	$\frac{2}{5}$	40	$\frac{3}{8}$	$.37\frac{1}{2}$
II	$\frac{1}{3}$	$.33\frac{1}{3}$	$\frac{3}{5}$	.60	$\frac{5}{8}$	$62\frac{1}{2}$
III	$\frac{2}{3}$	$.66\frac{2}{3}$	$\frac{4}{5}$	.80	$\frac{7}{8}$	$.87\frac{1}{2}$
IV	$\frac{1}{4}$	.25	$\frac{1}{6}$	$.16\frac{2}{3}$	$\frac{1}{12}$	$08\frac{1}{3}$
V	$\frac{3}{4}$	.75	$\frac{5}{6}$	$.83\frac{1}{3}$	$\frac{1}{16}$	$.06\frac{1}{4}$
VI	$\frac{1}{5}$	.20	$\frac{1}{8}$	$.12\frac{1}{2}$	$\frac{3}{16}$	$18\frac{3}{4}$

Or 450=9/10 of the required number. 1/10=1/9 of 450 or 50.
10/10 will equal 50×10 or 500.

The table given here can be used in any number of combinations and shows at a glance the decimal equivalent of the different fractions given.

One exercise can be given by multiplying the figures which are lettered by the figures which are numbered. For instance:

To multiply II by D, means that all figures in line II are to be multiplied by 8.

To divide IV by C means that all figures in line IV are to be divided by 13.

This can be used in subtraction and addition, and will be the basis of many interesting lessons in this important department of arithmetic.

After the pupil has studied the first exercises in percentage, we submit the following list of questions. It will be noted that there are but two numbers used in these problems. It will also be noted that no two problems are expressed exactly the same. If the pupils can perform these operations readily there is no question but that they understand the subject which they have been studying. If they cannot give these answers promptly it is only evidence that they need to give more time to the principles involved, and the more thoroughly these principles are mastered at the beginning of this subject the more readily will they grasp the various applications.

As in the division of decimals the all important feature was the point and not the review of the subject of division, so in percentage it is not important to review the fundamental operations but to understand the principles involved in percentage. We think this can be more easily accomplished by using simple numbers and in that way the fact can be emphasized.

SOME EXAMPLES IN PERCENTAGE.

What is ½% of 10?
What is 10 times ½%?
½ more than 10% is what?
½ less than 10% is what?
What per cent of 10 is ½?
How many per cent more than ½% is 10%?
½% is how many per cent less than 10?
10 is ½ of what number?
Of what does 10% equal ½?
10 is ½% more than what number?
What is ½% more than 10?
What is 10% less than ½?
½% is what per cent of 10%?
10% is how many per cent more than ½%?
Of what number does ½ equal 10?
What per cent of ½ is 10%?
10% is how many per cent more than ½%?
½ is 10% less than what number?
What number is 10 more than ½?
What is ½ more than 10%?
10% is ½ of what?
½% less than 10% is what?
10 times ½% is what?
10% more than ½% is what?
What is ½ more than 10%?
10% less than ½% is what?
Of what number does 10% equal ½%?
How many per cent less than 10 is ½?
10 is ½% less than what number?
What is 10% of ½%?
½ less than 10 is what?
What per cent of 10% is ½%?
How many per cent more than ½ is 10?
½% is 10 times what?
10% is ½ more than what?
What is ½% less than 10?
How many per cent more than ½ is 10?
½% of 10% is what?
½% is how many per cent less than 10%?
What is 10% more than ½?
Of what number does ½% equal 10?
½ is 10% more than what number?
10% is ½% less than what?
What per cent of ½% is 10%?
What is 10 more than ½?
½% is how many per cent less than 10%?
What is 10% of ½?
10% less than ½ is what?
½ more than 10 is what?
What is ½ of 10%?
10% is ½% of what?
What number is ½% more than 10?
½ is 10% of what number?
What is ½% of 10%?
What number is 10% more than ½?
What is ½ less than 10%?
10 more than ½ is what?
½% of 10 is what?
10 is what per cent of ½?
½% is 10% more than what?
What is ½% less than 10%?
½ of 10 is what?
What number is ½ more than 10?
½% more than 10% is what?
How many per cent less than 10% is ½%?
10 is how many per cent more than ½?
What is 10 times ½?
10% is ½ less than what?
½ is 10 more than what number?
What is 10% less than ½%?
10 is ½% of what number?
½ is what per cent of 10%?
½ is how many per cent less than 10?
10% more than ½ is what?
What per cent of ½% is 10%?
What is ½ of 10?
½% less than 10 is what?
10% is ½ more than what?
½% is 10% less than what?
Of what number does 10 equal ½%?
What is ½ less than 10?
10% of ½ is what?
What is ½ more than 10?
Of what number does ½ equal 10%?
10 is ½ more than what number?
10% is what per cent of ½%?
What is 10% more than ½%?
½ is 10 times what number?
What is 10% more than ½%?
What per cent of ½ is 10?
½ of 10% is what?
What is ½% more than 10?
10% is what per cent of ½?
10 is ½ less than what number?
10% of ½% is what?
½% more than 10 is what?
What is ½% more than 10%?
½ is what per cent of 10?
10 times ½ is what?
½% of 10% is what?
Of what does ½% equal 10%?
Of what number does 10 equal ½?

Interest

The Thousand Day Method.

We know of no method for computing interest so simple, rapid and accurate applying to all interest problems. Not a "catch" or a limited "short cut." Principle. The interest on any sum of money will exactly equal the principal in one thousand days at 360 p. Rule. Multiply the principal by the number of days and you have the interest at 360 p. by pointing off three decimal places in the Product.

PROBLEM.

Find the simple interest at 9 p. on $248.58 for 2 yr. 2 mo. and 20 days.

SOLUTION.

2 yr. 2 mo. 20 da. = 800 days.

$248.58
.800
4 | $198.86400 int. @ 360 p.
$49.716 Ans.

RATES.

Reduce time to days mentally. Find 360 p. interest then for

3 p. ÷ by 12.	12 p. ÷ by 3.
4 p. ÷ " 9.	7⅕ p. ÷ " 5.
4½ p. ÷ " 8.	5⅐ p. ÷ " 7.
6 p. ÷ " 6.	3⅗ p. ÷ " 10.
9 p. ÷ " 4.	3 3/11 p. ÷ " 11.

1 p. = 6 p. ÷ by 6.
10 p. = 10 × 1 p.
8 p. ÷ by 9 and multiply by 2.

Once tried Always used.

N.C.C.P.

Involution

- INVOLUTION.
  - Definition.
  - Operations.
    - Squaring.
    - Position of figures.
    - Cubing.
    - Algebraic signs.
    - Illustrations.
    - Principles.
  - Terms.
    - Root.
    - Power.
    - Exponents.
    - Coefficients.

Evolution

- EVOLUTION.
  - Definition.
  - Symbols.
    - Signs.
    - Names.
    - Significance.
    - Geometrical.
    - Algebraic.
  - Square Root.
    - Definition.
    - Application.
  - Cube Root.
    - Definition.
    - How extracted?
    - Illustration.
  - Examples.

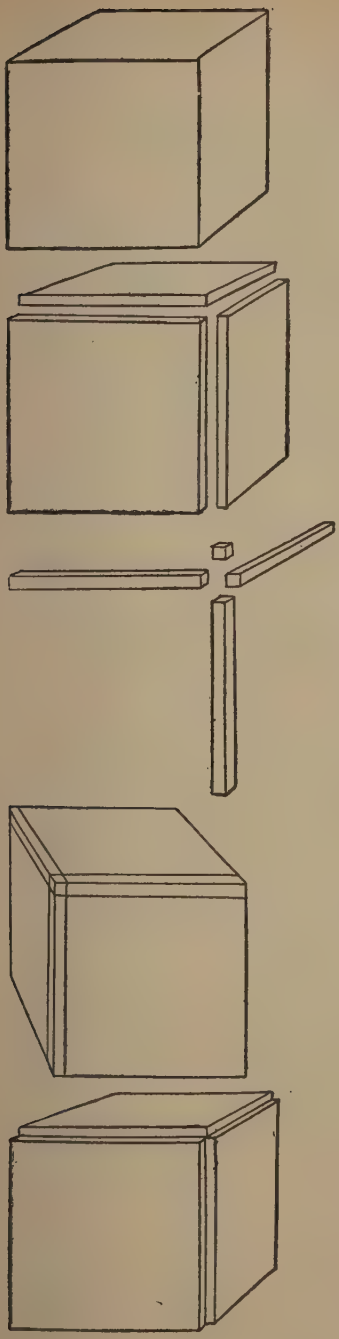
The most common applications of square root are:

1. Finding the dimensions of the square when the area is given.
2. Finding any side of a right triangle when the other two sides are given.

The two methods of extracting the square root are:

1. By factoring when the roots can be exactly obtained. Resolve any perfect power into its prime factors and take the product of half of these for the root.
2. By tens and units applicable to large numbers and imperfect powers. The square of a number consisting of two places of figures is equal to the square of the tens, plus twice the product of the tens by the units, plus the square of the units.

Diagrams should be used in developing this principle.



Cube root is the process of resolving a given number into three equal factors or of finding the length of one edge of a cube.

The radical sign ($\sqrt[3]{\ }$) with the small figure 3 over it, denotes that the cube root of the number over which it stands, is to be extracted. Thus, $\sqrt[3]{1728} = 12$.

There will be one figure in the cube root of a perfect power for each three figures and surplus of three figures in the power.

The cube of a number is the product of the number used three times as a factor.

The cube root is one of the three equal factors.

Every divisor in cube root is area or surface, and every dividend is cubical contents.

Any additions made to a cube must be made to each of the three faces.

By the use of the geometric or block method it will be very easy for the student to understand the process of extracting the cube root. If one understands thoroughly the "reason why" for each step, it will be unnecessary to take up the study of the rule.

We give you diagrams representing the divisions, additions and dividends. These graphic illustrations will prove helpful and enable the student to evolve a rule.

Required to find the cube root of 110592.

PROCESS.

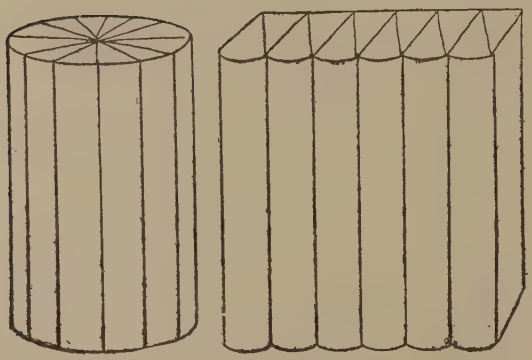
	110'592	40+8
	64 000	
$3\times40^2 =$	4800	46 592
$3\times40\times 8 =$	960	
$8^2 =$	64	
	5824	46 592

Every perfect cube consists of four parts, as illustrated above.

1. The cube of the tens.
2. Three times the product of the square of the tens by the units.
3. Three times the product of the tens by the square of the units.
4. The cube of the units.

MENSURATION.

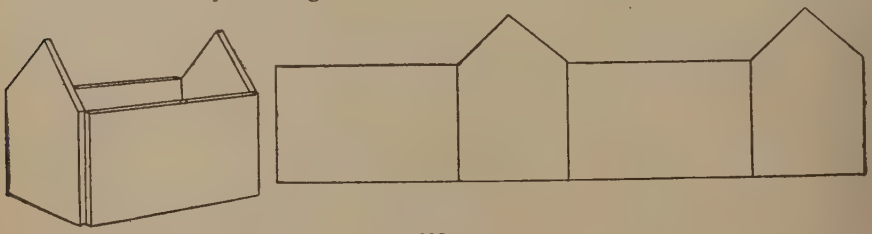
- Definitions.
- Circles.
  - Circumference.
  - Diameter.
  - Arc.
  - Radius.
  - Area.
  - Principles.
  - Applications.
- Plane figures.
  - Lines.
  - Angles.
  - Figures.
  - Construction.
  - Illustrations.
- Solids.
  - Definition.
  - Forms.
  - Volume.
  - Surface.
  - Examples.

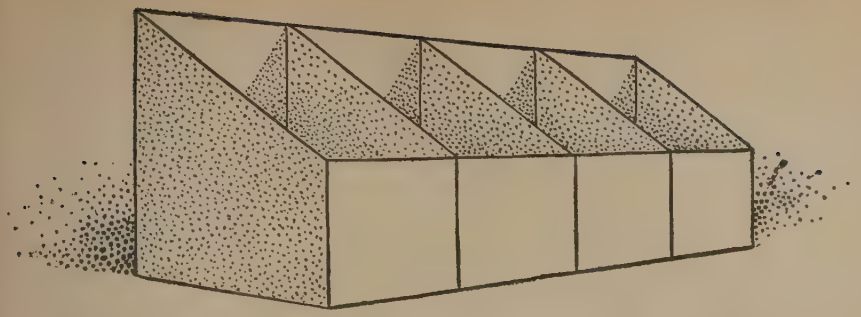


MENSURATION.

To find the volume of a prism or cylinder, multiply the area of the base by the altitude.

To find the convex surface of a right prism or cylinder, multiply the perimeter of the base by the height.





To find the number of bushels of grain in a bin or box, multiply the length in feet by the height in feet and then by the width in feet and then by 8, striking off the right hand figure. The result obtained will be the number of bushels. For instance: In a bin 10 feet long, 6 feet high and 8 feet wide, $10\times8\times6\times8=384.\phi$.

To find the approximate contents of a round bin or tank, square the diameter in feet and multiply by the depth in feet, then by 2 1/2, striking off the right hand figure. For instance: A tank 6 feet in diameter and 10 feet deep will contain $6^2=36$. $36\times10\times2\ 1/2=90.\phi$ barrels.

In estimating the contents of a cistern, one barrel is equal to 31 1/2 gallons and one hogshead to 2 barrels.

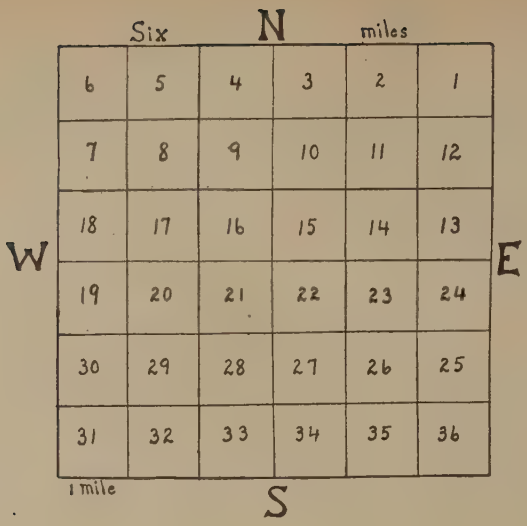
To find the number of barrels a cistern will hold, multiply the square of the diameter of the cistern in feet by the height in feet and divide this result by 4. For instance, if a cistern is 6 feet in diameter and 8 feet deep it will hold $6^2=36$. $36\times8=228\div4=57$ barrels.

To find the number of barrels in a square cistern, multiply the width, height and depth together and divide the product by 4. For instance:

A cistern 6 feet wide, 8 feet long and 4 feet deep, multiplied together equals 192. $192\div4=48$ barrels of 31 1/2 gallons each.

A tank 5 feet square will hold 6 barrels for every foot of depth.
A tank 6 feet square will hold 8 1/2 barrels for every foot of depth.
A tank 7 feet square will hold 11 1/2 barrels for every foot of depth.
A tank 8 feet square will hold 15 1/4 barrels for every foot of depth.
A tank 9 feet square will hold 19 1/2 barrels for every foot of depth.
A tank 10 feet square will hold 23 3/4 barrels for every foot of depth.

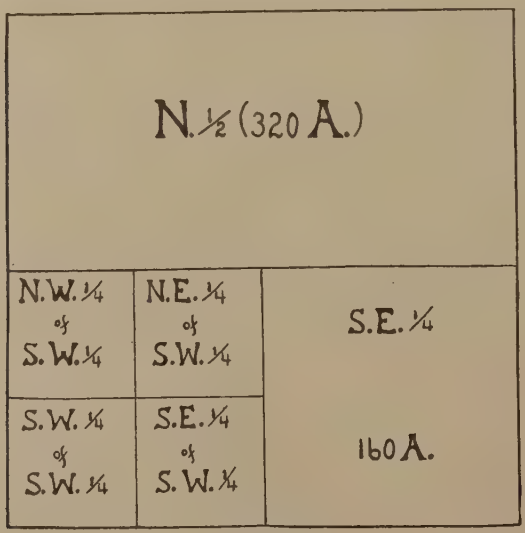
To find the medium diameter of a cask or barrel, add to the head diameter 2/3 of the difference between the head and bung.



A regular township, according to United States surveys, is 6 miles square and is divided into 36 equal parts or sections, each section containing 640 acres and measuring one mile square.

To fix permanently these values in the pupil's mind, a few exercises can be given in connection with the study of this diagram, such as:

How many acres of land in 4 3/4 sections?
How many more acres in 7 1/2 sections than there are in 3 sections?



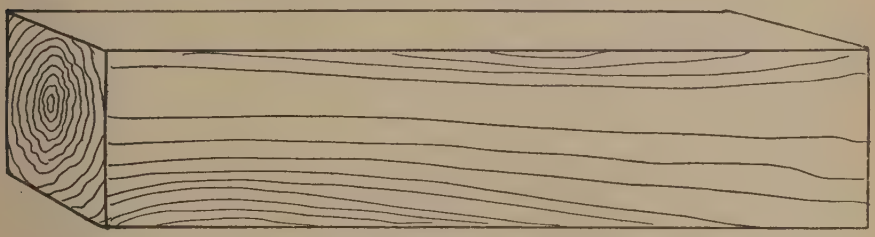
How many acres of land in 1/2 section?
How many acres of land in 2 1/2 sections?
How many acres of land in 5 sections?
How many more acres in 3 1/2 sections than in 2 sections?

To familiarize the pupils with the different divisions of a township, have them make diagrams showing farms located in different sections, such as—

The N. 1/2 of the S. E. 1/4.
The W. 1/2 of the S. E. 1/4.
The S. W. 1/4 of the N. E. 1/4.
The S. 1/2 of the N. W. 1/4.

Then after locating such farms interesting problems can be made computing the value, as:

What will be the cost at $35.50 per acre of a farm comprising the N. 1/2 of the S. E. 1/4?



A board foot, used in measuring lumber, is 1 foot long, 1 foot wide and 1 inch thick.

In computing dimensions of lumber, do not use fractions. If a board measures between 5 and 6 inches in width; if nearer 5 call it 5 inches and if nearer 6, call it 6.

To find the number of feet in a number of 12-foot boards, find the total width of the boards in inches and the sum will equal the number of feet in the pile.

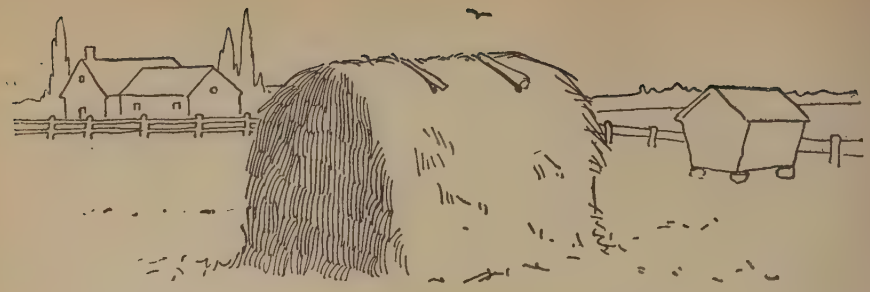
To find the number of feet in a number of 14-foot boards, add to the total widths of the boards 1/6 of the sum obtained.

To find the number of feet in 16-foot boards, add to the sum of the widths of the boards 1/3 of the result. For example: To find the number of feet in 6 boards 8 inches wide and 14 feet long, $6\times8=48$. 1/6 of $48=8$. $8+48=56$ feet, the number of feet contained in the boards.

To find the number of feet of lumber contained in a fence, multiply the sum of the widths of the boards in a portion of the fence by 16 1/2 and if more than 1 inch thick by the thickness, and divide by 12. The result obtained will be the number of feet contained in a rod of fence and this multiplied by the number of rods of fence will give the number of feet of lumber used. To illustrate:

To find how much lumber will be required to fence a square mile of land with three 6-inch boards and one 10-inch board in each panel of fence, $3\times6+10=28$ inches, total width of boards in each panel. $28\times16\ 1/2\div12=38\ 1/2$ feet in each rod of fence. The number of rods of fence around a square mile of land equals 1,280 rods multiplied by $38\ 1/2=49{,}280$ feet, number of feet of lumber in the fence.

To find the number of laths required in a room, find the number of square yards in the room and multiply by 18.



A ton of dry hay is estimated at 500 cubic feet to the ton.

To find the number of tons in a mow, multiply the length in feet by the height in feet and then by the width in feet and divide the result by 500. To illustrate: In a mow 30 feet long, 10 feet high and 20 feet wide there will be 30×10×20÷500=12 tons.

To find the number of tons in a stack, multiply the width in feet by the length in feet by 1/2 the height and divide by 500. For example: A stack 20 feet long, 10 feet high and 15 feet wide will contain 15×20×5÷500=3 tons in the stack.

To find the contents of a round stack, multiply the distance around the stack in yards by itself and then multiply by 4 times the height in yards, striking off two places from the right of the result thus obtained. This gives the number of cubic yards in the stack and by dividing by 20 will give the number of tons. To illustrate: A stack 20 yards around and 8 yards high will contain 20×20×32=128øø. 128øø÷20=6 2/5 tons.

To find the contents of a crib in bushels of shelled corn, multiply the number of cubic feet in the crib by 4 and strike off the right hand figure. To illustrate: A crib 18 feet long, 10 feet high and 8 feet wide will contain 18×10×8×4 or 576ø bushels.

To find the number of heaped bushels of ear corn contained in a crib, multiply the number of cubic feet in the crib by 6 and strike off the right hand figure, as, a crib 15 feet long, 10 feet high and 8 feet wide will contain 15×10×8×6 or 720ø bushels.

When the sides of the crib are flared, multiply the height in feet by half the sum of the top and bottom widths and then multiply by the length in feet, multiplying the result by 4 and striking off the right hand figure. For example: A crib 12 feet wide at the top, 8 feet wide at the bottom, 14 feet long and 10 feet high will contain 12+8÷2=10 feet, average width. 10×10×14×4=560ø bushels.

RULES IN MENSURATION.

To find the slant height of a cone when the diameter of the base and the altitude is given, extract the square root of the sum of the squares of the altitude and one-half the diameter.

To find the area of the convex surface of a regular pyramid or cone, multiply 1/2 the sum of the perimeter of the two bases by the altitude.

To find the area of the surface of a sphere, multiply the circumference by the diameter.

To find the volume of a sphere, multiply the convex surface by 1/3 of the radius.

To find the area of a parallelogram, multiply the base by the altitude.

To find the area of a triangle, multiply the base by 1/2 the altitude.

To find the area of a trapezoid, multiply 1/2 the sum of the parallel sides by the altitude.

To find the area of a polygon, divide into triangles and find the sum of their areas.

To find the area of a circle, multiply the radius by 1/2 the circumference.

To find the circumference of a circle, multiply the diameter by 3.1416.

To find the hypothenuse of a right-angled triangle, when two dimensions are given, extract the square root of the sum of the squares of the three dimensions.

To find the base or perpendicular of right-angled triangle, from the square of the hypothenuse subtract the square of the given side and extract the square root of the remainder.

To find the volume of a pyramid or cone, multiply the area of the base by the altitude and divide by 3.

To find the convex surface of a cylinder, multiply the circumference of one base by the altitude.

To find the volume of a cylinder, multiply the area of one base by the altitude.

To find the volume of the frustum of a regular pyramid or cone, multiply the sum of the areas of the two bases plus the square root of their product by 1/3 the altitude.

To find the contents of an irregular body, immerse the body in a vessel full of water, and measure the quantity of water displaced.

To find the area of a rectangle, multiply the length by the breadth.

To find the diameter of a circle, divide the circumference by 3.14156; or multiply it by .318309.

To find the side of a square equal to a given circle, multiply the diameter by .886227 or ½ of $\sqrt{3.14156}$.

To find the diameter of a circle equal to a given square, multiply the side of the square by 1.12838.

To find the side of an inscribed square, multiply the diameter by .707106, ors $\sqrt{5}$; or the circumference by .225079.

To find the circumference from an inscribed square, divide the side of the square by .225079.

To find the side of the largest inscribed equilateral triangle, multiply the diameter by .866025.

To find the diameter of the three largest equal circles that can be inscribed in a given circle, divide the diameter of the given circle by 2.155.

To find the contents of a cube, multiply three sides together.

To find the surface of a cube, multiply the square of the length of one of its sides by 6.

Business Forms.

TIME NOTE WITH INTEREST.

$450. Memphis, Tenn., Feb. 4, 1901.

For value received, sixty days after date I promise to pay to John G. Rogers, or order, four hundred fifty and 00/100 dollars, with interest at 6% per annum.

GEORGE L. HOLMES.

DEMAND NOTE.

$500. New York, Sept. 7, 1903.

On demand, for value received, I promise to pay to Edward L. Reynolds, or order, five hundred and 00/100 dollars, with interest at 7%.

WILLIAM ROBERTS.

JOINT NOTE.

$650. Chicago, Ill., June 15, 1906.

Ninety days after date, for value received, we promise to pay to the order of Robert L. Taylor, six hundred fifty and 00/100 dollars, with interest at 6%, at the First National Bank of Chicago.

THOMAS L. HANLEY.
MARY B. HANLEY.

SIGHT DRAFT.

$560.50. Bloomington, Ill., Aug. 4, 1905.

At sight, pay to the order of Albert L. Bond five hundred sixty and 50/100 dollars, value received, and charge to the account of

FIRST STATE BANK.

To Prairie State Bank, Chicago, Ill.

TIME DRAFT.

$150. San Francisco, Cal., Dec. 1, 1905.

Thirty days after date pay to the order of M. A. Mitchell, one hundred fifty and 00/100 dollars, at the First National Bank of Los Angeles, and charge to the account of

To Reed, Jones & Co., Los Angeles, Cal.

NORMAN A. PALMER.

ORDER.

$40. Baltimore, Md., May 9, 1904.

Please pay to Richard A. Fenton, forty dollars, and charge to the account of

To Franklin Bros. Co., Baltimore, Md.

HENRY W. ALLEN.

DUE BILL.

$190. Cincinnati, Ohio, March 1, 1902.

Due James L. Arnold, for value received, one hundred ninety dollars.

D. A. CURTIS.

RECEIPT.

$125. Madison, Wis., June 10, 1903.

Received of Herbert R. Morris, one hundred twenty-five dollars, in settlement of account.

JAMES R. STONE.

IN FULL OF DEMAND.

Johnstown, Pa., May 5, 1901.

Received of James M. Brown, four hundred fifty dollars, in full of all demands to date.

FRANK L. MARTIN.

ORDER FOR GOODS.

Ward, Smith & Co., Tacoma, Wash. Everett, Wash., Nov. 1, 1906.

Deliver to R. S. Marsh, merchandise to the value of seventy-five dollars and charge to my account.

WILTON S. LONG.

Every book is a good book that sets the reader in a working mood. The deep book, no matter how remote the subject, helps us best.
—*Emerson.*

The Arts

THE NEW PRACTICAL REFERENCE LIBRARY devotes much space to subjects relating to the FINE ARTS. The most casual observer and reader will admit we are indebted to countless generations for our present state of civilization. That we should know of their unceasing struggles for success seems proper and fitting. No channel affords a better means for such knowledge than a knowledge of the FINE ARTS.

The general articles on ARCHITECTURE, SCULPTURE, PAINTING, MUSIC, etc. (elsewhere outlined), are interestingly and fully treated. Throughout each article will be found innumerable cross references, which, if looked up, will give a broad and clearly defined conception of these important branches of knowledge.

The parent or teacher will find it easy to arouse deep interest on the part of the boy and girl by beginning with queries closely associated with their own surroundings. For instance, questions such as these: "In what style of architecture is the schoolhouse built? The city hall? The court house? Your home?" "Is this picture done in water color or oil?" "When, where and by whom was the first piano made?" etc., will not only create the proper degree of interest but will stimulate observation and develop a desire to know more and more of these branches which ultimately will lead the young student to trace each branch to its earliest known history. It is only by knowing the past that we can fully understand and appreciate the present.

Through the study of architecture and sculpture we get glimpses of the life, customs, education, civilization, religious beliefs and ambitions of the early peoples of Egypt, Greece and Rome, as revealed by their magnificent tombs, their massive pyramids with their hieroglyphics, their obelisks, and their gods of idolatrous worship.

The natural and refining influence gained in the study of music and art, the delving into the biographies of world-famous musicians and artists, are indispensable acquisitions, to say nothing of the broadening effect to one's knowledge.

By the proper use of THE NEW PRACTICAL REFERENCE LIBRARY in any home or on the desk of the teacher, a study of, and an intimate acquaintance with, these important branches of human activity becomes not only possible but delightfully pleasant.

Architecture

The study of ARCHITECTURE is as important as it is instructive and interesting. The student who reads the interesting article on PYRAMIDS and correlated subjects in THE NEW PRACTICAL REFERENCE LIBRARY must be profoundly impressed with the ability and skill displayed by the nations of the long ago, and lost in fascinating wonder when he dwells on the genius of that time as illustrated by the raising, moving and proper adjusting of slabs of marble and granite, weighing hundreds of tons, for the temples and tombs, tasks beyond the accomplishment of the most skilled architect and engineer of our times, aided by twentieth century inventions.

It is our aim to give a mere skeleton to the study of ARCHITECTURE, leaving the searcher for knowledge the pleasant and profitable task of outlining the various phases of this study as extensively as desired. All the principal buildings of the world, such as WESTMINSTER ABBEY, are each fully described under their proper headings and thus furnish the teacher and pupil an inexhaustible field for interesting study.

ARCHITECTURE—ANCIENT AND MEDIEVAL.

EGYPTIAN ARCHITECTURE.
- Style.
- Construction.
- Permanency.
- Religious belief.
- Tombs.
- Temples.
- Pyramids.
- Statues.
- Hieroglyphics.

CHALDEAN-ASSYRIAN.
- Construction.
- Sun-dried brick.
- Carved stones.
- Stucco.
- Vaults.
- Arches.

GOTHIC.
- Origin—time—place.
- Characteristics.
- Decorations.
- Painted arch.
- Examples.
  - Notre Dame, Paris.
  - Cathedral Cologne.
  - Cathedral Rheims.

ORIENTAL.
- Style.
- Endurance.
- Towers.
- Monasteries.
- Pagoda.

GREEK.
- Style.
  - Beauty.
  - Simplicity.
  - Harmony.
- Period of perfection.
- Orders.
  - Doric.
  - Ionic.
  - Corinthian.
- Sculpture.
- Painting.
- Column.
- Examples.
  - Parthenon.
  - Erectheum.
  - Theseum.
- Theater.

ROMAN.
- Aqueducts.
- Sewers.
- Amphitheaters.
- Magnificent villas.
- Triumphal arches.
- Monumental pillars.
- Thermæ (baths).
- Examples.
  1. Colosseum.
  2. Pantheon.

BYZANTINE.
- Time and place of origin.
- Dome.
- Examples.
  - Sophia, Church of Saint.
  - Saint Marks, Venice.

ROMANESQUE.
- Semi-circular arch.
- Towers.
- Porches.
- Crypts.
- Ornamental façades.
- Rib.
- Examples.
  - Church of San Ambrogolio.
  - Cathedrals at Speyer and Worms.

Correlated subjects:
- Cathedral.
- Window.

The subjects listed below will be found interestingly treated in THE NEW PRACTICAL REFERENCE LIBRARY. The reader will in turn be referred to other correlated subjects which, if looked up, should make the study of ARCHITECTURE delightfully complete and entertaining.

Acropolis.
Arch.
Acoustics.
Aqueduct.
Bridges.
Building.
Dome.
Façade.
Hall.
Babel, Tower of.
Baptistry.
Buttress.
Colosseum.
Basilica.
Amphitheater.
Carving.
Catacombs.
Column.
Cathedrals.
Church.
Frescoes.
Mosaics.
Theater.
Vault.
Campanile.
Gable.
Indian architecture.
Roof.
Spire.
Window.
Pyramid.
Temple.
Stadium.
Crypt.
Sphinx.
Forum.
Pagoda.
Elizabethan architecture.

QUESTIONS.

What is architecture? To what remote period can we trace it?

In what style of architecture is your church built? Your schoolhouse? Your county court house? Your city hall? Your state capitol? The National Capitol at Washington?

For how many years did Cheops employ one hundred thousand men to erect the great pyramid? How many acres does it cover?

What is yet the height of the great pyramid? What does its interior contain?

What special claim have the Egyptians to distinctive architecture? Was architecture their supreme art?

With what were the temples, tombs and statues of Egypt decorated?

Why were the tombs of the Egyptians built so strong that time could not destroy and enemies could not rifle them?

What place in Egypt because of its many pyramids is called the "Westminster Abbey of Egypt"?

What is the generally accepted belief as to the construction of the pyramids? How did the length of a king's reign affect the size of the monument?

Describe the Greek sphinx of mythology.

What riddle did the sphinx of Grecian mythology propose and who guessed it?

How were the Buddhist temples built out of solid rock?

What characterized the early Greek architecture? Who were the three great architects of Greece?

How would the seating capacity of the larger Greek theaters compare with those of today?

The Parthenon in the Acropolis at Athens is said to be the most perfect building ever erected. When was it built? Of what material? How long is it? How broad? How high? How many pillars did it originally have?

How did the Roman amphitheater differ from the Grecian theater?

What were the thermæ? What have the excavations at Pompeii revealed as regards the arrangements of the Roman dwelling house?

Describe the Pantheon at Rome. What is strikingly unique about its

magnificent dome? What famous painter is buried within its walls? What arch built about 500 B. C. can still be seen in Rome?

What models of nature are used for decorations on the Gothic style?

What group of recent buildings were unexcelled in their architectural beauty of design?

Sculpture

The outline on SCULPTURE is made brief from lack of space. The student and reader, however, can delve deeply into this interesting and instructive department by referring to the scores of correlated subjects in THE NEW PRACTICAL REFERENCE LIBRARY. For example, if detailed information is wanted about the characteristic Egyptian sculpture, the student will refer to the articles on SPHINX, PYRAMIDS, TOMB, OBELISK, HIEROGLYPHICS, etc. If the details of the Grecian style of sculpture are desired, one is referred to the PARTHENON, CLEOPATRA'S NEEDLE, etc., and to the famous Greek sculptors, LYSIPPUS, PHIDIAS, etc. If the detailed history of sculpture in our own country is sought, ample information will be found in looking up the biographies of noted sculptors, like SAINT GAUDENS, LORADO TAFT, BROWNE, etc.

SCULPTURE.

I. KINDS.
  1. Carving.
    a. Methods.
    b. Materials.
  2. Modeling.
    a. Construction.
    b. Casting.
    c. Materials.

II. FORMS.
  1. In the round. Object stands how? Give example.
  2. In relief. Object projects in what manner? Give example.
  3. In intaglio. Cut how?

III. HISTORY.
  1. Egypt—Characteristics—Type.
  2. Assyria—Compare with Egyptian—Lacking in what?
  3. Greece.
    a. Early period—Character—Style.
    b. 500 B. C.—Progress—Aim—Blending of what?
      Sculptors—Art reached perfection when?
      Masterpieces. Name three.
    c. 350 B. C.—Aim.
      Masterpieces. Name them.
      Sculptors. Name three.
  4. Italy.
    a. Early period—Imitation of what style?
    b. Twelfth century—Characteristics—Aim.
      Masterpieces. Name the three most famous.
      Sculptors. Who were the most noted? Of these the most famous?
    c. Eighteenth century—Progress—Aim—Results.
    d. Modern—Aim.
      Masterpieces. List four of the most famous.
      Sculptors. Name four.

5. France.
   a. Early period—Status.
   b. Fifteenth to eighteenth century—Aim—Influence.
   c. Modern school.
      Sculptors. Name four, with masterpieces of each.
6. Germany.
   a. Early period—Status—Lacking in what?
   b. Renaissance—Style—Name four sculptors.
   c. Modern school—Influenced by whom?
      Sculptors, and masterpieces of each.
7. England.
   a. Early period—Scope.
   b. English school dates from what time?
   c. Nineteenth century—What spirit pervaded English art?
   d. Modern school—Style—Aim.
      Sculptors. Name five and give masterpieces of each.
8. United States.
   a. Modern school—Style—Aim—Results.
      Sculptors. List five of America's most famous sculptors.
      Masterpieces. Give location of five masterpieces. By whom?

QUESTIONS.

What is sculpture?
What are the materials most generally used?
In what country was sculpture first practiced?
What specimens of this early period exist today?
When does the sculptor's work proper end?
What is the characteristic of American sculpture?
How has sculpture aided us in knowing of the early history of the world?
What are the three forms of sculpture usually recognized?
To what form does the sculpture in your city belong?
What are the most famous statues by Saint Gaudens? Where located?
Who made the famous "Liberty" statue? What is its height? What is remarkable about it?
What are the principal works of Thorwaldsen?
What is the striking characteristic of his "Christ the Comforter" (see full-page illustration), and where found?
In what museum is the statue illustrating "The Dying Gaul" placed? (See full-page illustration.)
For what is Lorado Taft noted? Greenough? Browne?

NOTE.—Biographies of the following list of sculptors will be found interesting. Others may be added as your time will permit.

Phidias.	Ghiberti.	Canova.	Schadow.
Praxiteles.	Donatello.	Houdon.	Partridge.
Lysippus.	Vinci.	Bartholdi.	Dupre.
Greenough.	Michelangelo.	Kraft.	Thorwaldsen.
Ward.	Bernini.	Taft.	Daniel French.
Foley.	Browne.	Flaxman.	William Story.
Cellini.	Saint Gaudens.	Hosmer.	Drake.
Gibson.	Crawford.	John Rodgers.	Randolph Rodgers.

Painting

The general article on painting in THE NEW PRACTICAL REFERENCE LIBRARY gives a comprehensive review of the development of this fascinating art from the earliest times in the different nations as exemplified by the various schools.

The student will find it a pleasant task to acquaint himself by aid of this satisfactory guide with this delightful branch of human knowledge. He will find interesting, instructive biographies of all the noted painters under their respective titles from the earliest times to those of the present day, with mention and description of their masterpieces.

That such a fund of knowledge is in itself a source of pleasure is self-evident. That it has a natural refining and elevating influence no one can gainsay. To live but for a few brief minutes daily in the atmosphere and have for silent companions MICHELANGELO, RAPHAEL, RUBENS, LANDSEER, ROSA BONHEUR, and scores of others, must broaden the intellect, quicken the imagination, sweeten the heart and inspire to nobler ambitions.

It certainly should be the pleasant duty of every parent and teacher to create and foster a love for all that is beautiful in art as in literature.

PAINTING.

DIVISIONS.

Decorative.
- (a)
- (b)

Portrait.
Genre.
Landscape.
Seascape.
Architectural.
- (1)
- (2)

GREAT PAINTERS (which see).

Giovanni Cimabue.
Van Eycks.
Hans Membling.
Leonardo da Vinci.
Michelangelo.
Titian.
Fra Bartolomeo.
Andrea del Sarto.
Rembrandt.
Raphael.
Correggio.
Burne-Jones.
Whistler.
Landseer.
Sargent.
Murillo.

MATERIALS USED.

Oil.
- Wood panels.
- Canvas.

Water Color.
- Paper.

Fresco.
- Wet plaster.

Tempera or Distemper.
Enamel.

TWELVE GREAT PAINTINGS.

Transfiguration. Sistine Madonna. Raphael.
Last Judgment. Michelangelo
Communion of Saint Jerome.
Descent from the Cross. Rubens.
Descent from the Cross. Volterra.
Last Supper. Vinci.
Assumption of the Virgin. Titian.
The Night. Corregio.
Aurora.
Beatrice Cenci. Guido Reni.
Immaculate Conception. Murillo.

HISTORY.

Ancient Period.
- In Egypt.
  - On Tombs.
  - Temples.
  - Mummy Cases.
  - Papyrus.
  - Representative of what.
- In Greece.
- In Rome.
  - Pompeii.
  - The Baths.
  - The Tombs.
  - The Catacombs.
  - Byzantine Decorations.

Mediæval Period.
Renaissance Period.
- Schools—
  - Florentine School.
  - Venetian School.
  - Umbrian School.
  - Roman School.

Sixteenth Century.
Later Periods.
History in United States.

What is the art of painting? What is oil painting? Water color? Fresco? Enamel? How produced?

How and on what were the early paintings of the Egyptians, Greeks and Romans executed?

How many centuries before Christ was painting practiced in Egypt? Was the art closely related to religion and a result of it? In what relation was it held to sculpture and architecture?

What do these early Egyptian paintings generally represent and on what were they generally pictured?

Was any attempt made by these artists to imitate nature?

Of what great historic value are these early Egyptian paintings? Give three reasons for your answer.

By whom were the principal works of Roman art produced?

Describe the conditions of Roman painting for the first three centuries after Christ.

What were the Catacombs (see)? How were they built? Decorated? Protected? Inhabited?

By what art in the Catacombs did the early Christians indicate their religious devotion?

Who was one of the first great English painters?

What does the Umbrian school characterize?

What was striking about the Florentine school?

When did art in the United States take on an individuality of its own?

What are the strikingly distinguishing marks between American art of 1855 and 1900?

Name five well-known American painters, with a great painting from each. For what was Whistler noted?

What are the twelve greatest paintings in the world; by whom, where found, and when produced?

What kinds of knowledge are requisite in a painter?

What discovery of the Van Eycks produced a revolution in the art of painting?

By what process are mosaics made?

Where are the early Egyptian paintings found and what is their character?

What are the only examples of pure Grecian painting?

What was the Byzantine influence on painting?

What did the Renaissance do for Italian painting?

Why was Italian art of the fifteenth century often better than any that followed?

What was the greatest period in the history of modern art? What brought about a decline?

What are the chief names in the history of nineteenth century painting?

What is the general process of fresco painting? When was its greatest development?

What was the first or mosaic method of making ornamental glass windows?

What is the combination method of today?

What are the distinguishing features of Byzantine art?

What is meant by the Rembrandt style of picture?

Music

In THE NEW PRACTICAL REFERENCE LIBRARY the department of music is under three heads: musical terms, musical instruments, and biographies of musicians. The general article *Music* contains the subheads: NATURE AND TERMINOLOGY OF MUSIC, NOTATION and HISTORY, the last subdivision containing references to the greatest of the world's musicians of all times.

The list of terms given in the outline under the subhead musical terms contains but a small proportion of the articles included in the encyclopedia. The article musical instruments is but a list of cross references to the most important instruments. Many of the biographies of the greatest composers, singers and instrumentalists may be reached by means of cross references from the general article *Music*. There are also in this department of music a number of general articles on such topics as *Hymns* and *Hymn Tunes* and *Hymns, National*.

MUSIC.

I. TECHNICAL.
- 1. Nature and theory of.
- 2. Terms used.
- 3. Notation or reading of.
- 4. Pitch and duration of tones.

II. MUSICAL TERMS.
- 1. Orchestra.
- 2. Opera.
- 3. Harmonics.
- 4. Oratorio.
- 5. Harmony.
- 6. Recitative.
- 7. Scale.
- 8. Singing, etc.

III. MUSICAL INSTRUMENTS.
- 1. Drum.
- 2. Cornet.
- 3. Violin.
- 4. Pianoforte.
- 5. Organ.
- Others.

IV. GREAT MUSICIANS.
- 1. Handel.
- 2. Beethoven.
- 3. Mendelssohn.
- 4. Bach.
- 5. Patti.
- 6. Sousa.
- 7. Nordica.
- 8. Kubelik.
- 9. Rubenstein.
- 10. Paderewski.

V. HISTORY.
- 1. Ancient.
  - Egypt.
  - Assyria.
  - India.
  - Greece.
  - Rome.
- 2. Modern.
  - German.
  - Italian.
  - Russian.
  - English.
  - Swedish.

CORRELATED SUBJECTS:

NOTE.—Consult names of all noted musicians under general subject "Music."

Also:

Jennie Lind.	Balfe.	Corelli.	Strauss.	Weber.
Auber.	Berliotz.	Schumann.	Schubert.	Offenbach.
Bach.	Chopin.	Myerbeer.	Wagner.	Others.

QUESTIONS.

Of the fine arts which is the finest and purest?
From what relative did Mme. Patti receive her musical training?
What popular opera has Sousa composed?
Under what familiar name did Madame Otto Goldschmidt appear?

What stage of music had England attained to in the time of Handel?

What is the general character of the Scandinavian music?

Why of all the arts does music appeal to the rank and file the most?

What did each of the following nations try to emphasize in their music: Italy, Germany, England, Scandinavia and France?

Why is music largely characteristic of the nation?

What factor has Christianity been in the growth of music?

What were some of the ancient musical instruments? Give a list of modern instruments.

Give a list of the famous composers of music. A list of celebrated players of instruments. A list of singers, sopranos, tenors, bass.

What is the record of Martin Luther in regard to music?

Of what nationality is Kubelik? What has been his career? Of what instrument is he a master?

Of what nationality is Paderewski? How old is he? Of what instrument is he master?

How old is Adelina Patti? How does she rank as a soprano?

What great oratorio did Handel compose? How was this received at the time?

What is the record of Theodore Thomas in Chicago? What in general was the aim of his work? What is Orchestra Hall? For what, and at what cost, was it erected?

For what is Reginald De Koven noted?

What part in singing does Edouard De Reszke take? What is his record?

What part does Jean De Reszke take? Give his record.

How does the violin rank as compared with other instruments?

What is the meaning of oratorio? Give a list of celebrated oratorios.

What is a military band? Who was the first celebrated leader of such bands? He has been succeeded by whom? What is the most celebrated military band in the United States?

What is the national hymn of America, Germany, England, France, etc.?

How is "Chopin" pronounced?

Engraving

The article *Engraving* is particularly complete in its cross references. A glance at the outline shows that the whole subject may be reached from the general article Engraving. Cross references under *Halftone* lead to the subject of *Photography.*

OUTLINE.

I. Engraving.
  1. Halftone.
    a. Etching.
      Engraving
      Zinc Etching.
    b. Photography.
      Camera.
      Electrotyping.
      Lithography.
      Photogravure.
      Daguerreotype.
  2. Zinc Etching.
    a. Photography.
    b. Halftone.
  3. Etching.
    a. Engraving.
    b. Zinc Etching.
  4. Mezzotint.
    a. Engraving.
    b. Etching.

CORRELATED SUBJECTS.

1. Printing.
2. Halftone.
3. Etching.
4. Aquatint.
5. Mezzotint.
6. Photography.
7. Lithography.
8. Electrotyping.
9. Camera.

QUESTIONS.—ENGRAVING.

What is engraving? What materials are used?

What were the early uses of engraving?

Where and when did engraving for the purpose of printing originate? What material was used?

When and by whom was printing from metal plates discovered?

What was the importance and scope of engraving in early times?

What other processes have largely done away with this art? Describe them and tell of their importance at the present time.

What is the process of producing a wood engraving? An engraving from metal?

What is a zinc etching? Why are they used so largely to illustrate the daily papers?

When did photography first come into use? Who was Daguerre?

Compare the process of ancient engraving with those in use today.

What is an electrotype? Lithograph? Halftone?

That which makes life worth living cannot be bought with money. If you are rich you may buy a fine house, but you cannot buy a happy home; that must be made,—made by you and by those who occupy it with you. With money you may rent a pew in some fashionable church, but you cannot rent a good conscience,—that depends upon your manner of living and dealing with others.

—*Schaeffer.*

The man who is fond of good books is usually a man of lofty thought and of elevated opinions. —*George Dawson.*

Astronomy

Astronomy is the science which treats of the heavenly bodies. A general survey of this subject, together with a short history, is given in the general article *"Astronomy,"* which therefore forms a suitable introduction to the subject.

The other phases of the subject may be found in articles to which cross references are made in this general article, such as *Sun, Moon,* etc.

Definitions of the most important astronomical terms are also included in this first division, which is connected by means of cross references with all other subjects bearing upon this department.

The biographical department contains articles on all the chief astronomers and gives all the particular work which they accomplished.

The study of astronomy can be made not only very extensive but very interesting, even to the boy, by reference to our splendid outlines and the explanatory articles in THE NEW PRACTICAL REFERENCE LIBRARY.

The general subjects are of early interest to every child mind. The pupil comes into such vital contact with the planet on which he lives; the sun which brings life to the earth; the moon and stars which shed their silvery beams about his way; in fact, touching nature at all points of his environment, his interest is easily aroused, and such phenomena as *Day* and *Night,* the *Seasons* and other interesting subjects will be early introduced by the successful teacher.

The classified treatment here presented, together with the simplicity of the language, makes our work ideal for the home and school.

OUTLINE.

I. GENERAL.
- 1. Apsides.
- 2. Ascension, Right Declination.
- 3. Astronomy.
  - a. Asteroids.
  - b. Astro-Photography.
  - c. Comets.
  - d. Earth.
  - e. Moon.
    - Tides.
  - f. Planet.
  - g. Solar System.
  - h. Stars.
    - Constellations.
      - Zodiac.
      - Cassiopeia.
      - Orion.
      - Milky Way.
      - Bear, Great.
  - i. Sun.
  - j. Spectrum Analysis.
    - Spectroscope.
    - Light.
    - Rainbow.
    - Telescope.
- 4. Calendar.
- 5. Chromosphere.
- 6. Conjunction.
- 7. Eclipse.
- 8. Horoscope.
  - Astrology.
- 9. Kepler's Law.
- 10. Latitude.
  - a. Antarctic Circle.

b. Equator.
c. Tropics.

11. Longitude.
12. Meteor.
13. Metonic Cycle.
14. Nebula.
    Nebular Hypothesis.
15. Node.
16. Nutation.
    Precession of the Equinoxes.
17. Observatory.
18. Parallax.
19. Pole.
20. Transit.
21. Universe.

II. Divisions of Time.

1. Day.
   a. Divisions.
   b. Sidereal Day.
   c. Solar Day.
   d. Civil Day.
2. Week.
   a. Length.
   b. Names of days.
3. Month.
   a. Names and length.
   b. Anomalistic Month.
   c. Sidereal Month.
   d. Lunar Month.
   e. Solar Month.
   f. Origin of the name.
4. Year.
   a. Days.
   b. Weeks.
   c. Months.
5. Seasons.
   a. Names.
   b. Length.
   c. Characteristics.

III. Planets.

1. Definition.
2. Number.
3. Name (Origin Name).
4. Corresponding Weight.

IV. Biographies of Astronomers.

Ptolemy.	Kepler.	Newton.	Herschel, Sir J.
Brahe.	Galileo.	Herschel, Sir W.	Halley.

V. General Divisions.

1. Descriptive Astronomy.
   a. Description of the
      Motions.
      Figures.
      Periods of revolution.
      Other phenomena of the heavenly bodies.
2. Practical Astronomy.
   a. Teaches how to observe the
      Motions.
      Figures.
      Periodical revolutions.
      Distance of the heavenly bodies.
      How to use necessary instruments.
3. Physical Astronomy.
   a. Explains cause of motions.
   b. Demonstrates laws by which causes operate.
4. New Fields of Investigation.
   a. Astro-Photography.
   b. Spectrum Analysis.

First Studied: Most remote period 2500 B. C.
What remarkable phenomenon was recorded by the Chinese?

VI. Astronomy in India.

1. Annual motion of Jupiter and Saturn observed in 3000 B. C.
2. Tables of the sun, moon and planets formed.
3. Eclipses calculated.

VII. Time of Alexander the Great.
1. Chaldeans had made astronomical observations for 1,900 years.
2. Regarded comets as bodies traveling how?
3. Predicted what?
4. Had what acquaintance with the universe?

VIII. Priests of Egypt.
1. Gave astronomy what?
2. Their ancient zodiacs.
3. What is shown by position of their pyramids?

IX. Among the Greeks.
1. Astronomy took scientific form.
2. Thales predicted solar eclipse.
3. Pythagoras (500 B. C.) promulgated theory that sun is center of universe.
4. Great progress made under Ptolemies.
5. Aristarchus (267 B. C.) taught double motion of the earth.
6. Hipparchus (150 B. C.) undertook catalogue of the stars.

X. System Propounded by Claudius Ptolemy.
1. Earth was center of universe.
2. Sun, moon and stars revolved around it.
3. Sphere of moon nearest to earth.
4. Spheres of planets next.
5. Spheres of fixed stars followed.
6. Two crystalline spheres succeeded these.
7. An outer sphere circumscribed all, wherein happy souls found abode.

XI. The Arabs.
1. Began to make observations middle of eighth century.
2. Continued in the science 400 years.
3. Made important observations of the disturbances of Jupiter and Saturn (A. D. 1000).

XII. Nicholas Copernicus. 1473-1543.
1. Introduced the system which bears his name.
2. Gives to sun central place in solar system.
3. Shows other bodies revolving around it.
4. This arrangement came to be generally received.
5. Substituted for complexities and contradictions of Ptolemy theory.

XIII. Tycho Brahe, Danish Astronomer.
1. Regenerator of practical astronomy.
2. Through his aid Kepler arrived at the following laws:
   a. That planets move in elliptical orbits, of which the sun occupies position of focus.
   b. That the imaginary straight line joining the sun and any planet moves over equal space in equal time.
   c. That the squares of the times of the revolutions of the planets are as the cubes of their mean distances from the sun.

XIV. Galileo.
1. Advanced the science how?
2. Established the truth of what theory?
3. Death occurred when?

XV. Newton.
1. Born when?
2. Did what for physical astronomy?
3. Deduced what theory?

XVI. Eighteenth Century.

1. The science enriched by Herschel's discovery of what?
2. Resolution of the Milky Way into myriads of stars.
3. Unraveling of the mystery of nebulæ.
4. Double and triple stars.
5. The analytical researches of Lalande, Lagrange, Delambre, Laplace.

XVII. Nineteenth Century.

1. Discovery of first four minor planets.
2. Existence of Neptune, more distant from the sun than Uranus.
3. Use of spectroscope and photography in investigation.
4. Former calculated distance of sun corrected.
5. Discovery of the two satellites of Mars.
6. Existence of an intra-Mercurial planet, named Vulcan, has not yet been verified.
7. Much work accomplished in ascertaining the parallax of fixed stars.

XVIII. Astronomical Topics.

1. Asteroids.
2. Comets.
3. Earth.
4. Moon.
5. Planet.
6. Solar System.
7. Stars.
8. Sun.

XIX. Works of Reference.

Proctor's "Other Worlds Than Ours."
"Half Hours with the Stars."
Flammarion's "Astronomy for Amateurs."
Young's "The Sun," "Astronomy."

QUESTIONS.

What would be your weight on the sun's surface? On the moon's?

What planet gives out 6,000 times more light than the sun and is 100 times larger in diameter?

Which is larger, the sun or the north star?

How many years would it require a train running 60 miles an hour without a stop to reach the sun?

What is the distance of the sun from the earth? The moon? The nearest star?

What is said to be the height of the mountains on the moon? How do they compare with our highest peaks?

How does the length of the days and nights on the moon compare with our own?

By the use of the most powerful telescope how near is the moon brought to the earth?

What is called the lines of apsides? What is its peculiar motion? Is this motion the same in all planets?

What time is represented by the anomalistic year? Which is the longer, the anomalistic or the sidereal year? How much longer?

How does the diameter of the largest of the asteroids compare with that of the earth?

Note.—Representing the sun by a globe two feet in diameter, the earth would be twenty-two hundredths of an inch in diameter—the size of a very small pea or a "twenty-two caliber round pellet." Its distance from the sun on that scale would be just 220 feet, and the nearest star (still on the same scale) would be 8,000 miles away at the antipodes. —Young's "Astronomy," page 174.

Note.—If a boy could walk four miles an hour, or forty miles in a day of ten hours, it would require 730 days, or two years, to walk around the globe. To walk to the moon would require 7,000 days, or about twenty years.

While there are more than 270 asteroids now discovered, how does their total mass compare with that of the earth?

What was the first record of an astronomical event, and its very ancient date?

What ancient people were probably acquainted with the true system of the universe?

With what people did astronomy take a somewhat scientific form?

Which of the Greeks taught the motion of the earth around its axis and around the sun?

When do meteors most frequently occur?

From what century does the present astronomical system date?

What is Aquarius, and when is the sun said to enter it?

What has been the most remarkable recent discovery in regard to comets?

In what manner is the term "earth shine" described?

What is the cause of an eclipse of the moon? Of the sun?

What is the average number of eclipses in a year?

Describe the term "coal sack," observed in the Galaxy, or what is commonly known as the Milky Way.

What is the course and the cause of the Milky Way?

What is the harvest moon?

What is the average diameter of the planet Jupiter?

What was the very valuable discovery regarding light made from observing Jupiter's satellites?

What is the theory concerning the distribution of water and land on the planet Mars?

What is the rare form of metal which is found in meteoric stones?

What are the gray plains of the moon?

To whom is the nebular hypothesis due? How is it now received by astronomers?

When and by whom was Neptune discovered? Is it visible to the naked eye?

How does the magnitude of the star Sirius compare with that of the sun?

What is the precession of the equinoxes?

What is computed to be the amount of light sent out from the sun?

Which of the planets has rings supposed to be made up of multitudes of satellites?

What festivals are survivals of sun-worship?

By what combination of principles is the telescope able to aid the eye?

What is the largest telescope in the world?

How short a day has Uranus and how long a year?

What two names did the ancients give Venus because of its alternate appearance in the morning and evening?

What is the zodiac? How was it divided by the ancients and what are the divisions called?

What is zodiacal light?

What two new fields of astronomical investigation have been opened up in recent years?

How has spectrum analysis helped establish the nebular hypothesis?

What star is approaching us and what one is receding from us?

How many years does it take light to come from the nearest star to us?

Why are some stars called variable, others temporary and others the fixed stars?

Which planet approaches nearest the earth?

To what two men is the systematizing of astronomy due?

What discovery of Newton practically completed the proof of the Copernican theory?

Why was Copernicus excommunicated by the pope?

Why is it more satisfactory to study the movements of the heavenly bodies by astro-photography than through the telescope?

What are the three main branches of astronomy? Which one of these divisions gives a description of the motions and figures of the heavenly bodies? Which division teaches us to observe the revolutions of the heavenly bodies? Name the division of astronomy which explains the causes of the motions and demonstrates the laws by which these causes operate.

What is the difference between an observatory and a laboratory? Where is the famous Yerkes observatory?

Who invented the telescope?

What led Galileo to observe the laws governing the oscillation of the pendulum? To what important discovery did this lead?

Why do we regard the sun as the most important of the fixed stars?

What is the diameter of the sun?

A borrowed book is but a cheap pleasure, an unappreciated and unsatisfactory tool. To know the true value of books, and to derive any satisfactory benefit from them, a child must feel the sweet delight of buying them,—he must know the preciousness of possession.

Learn to be a good reader, which is perhaps a more difficult thing than you imagine. Learn to be discriminative in your reading; to read faithfully, and with your best attention.

—*Carlyle.*

No profit grows where is no pleasure taken.
—*Shakespeare.*

Athletics

The American parent and teacher invariably encourage a desire for manly, healthy sports and pastimes in the child, and, indeed, this would be a dreary world if everybody worked all the time and never took any recreation; so, too, might this be called a dull work did it not give special treatment to this subject.

With the above thought in view THE NEW PRACTICAL REFERENCE LIBRARY gives space to these subjects, treating them in an interesting way, emphasizing the point that such sports and pastimes are not only recreation but are intellectual and developing in their nature.

We divide this subject into several classes, and briefly outline the subject of *Football.*

OUTDOOR GAMES.

Ball, Baseball; Cricket, Football, Archery, LaCrosse, Quoits, Polo, Bowls, Croquet, Curling, Tennis, Golf.

INDOOR GAMES.

Billiards, Casino, Cribbage, Whist, Chess, Checkers, Dominoes, Legerdemain.

SPORTS.

Rowing, Bicycling, Swimming, Boxing, Olympic Games, Gladiators, Coliseum, Chariot.

ATHLETIC TRAINING.

Gymnastics, Calisthenics, Wrestling, Dancing.

MISCELLANEOUS.

Games, Angling, Palmistry, Opera, Nimrod, Museum, Fencing, Theater, Yacht.

Football

I. GENERAL DESCRIPTION.
  1. Sides.
    a. Number of men.
    b. Position.
    c. Duties.
    d. Movements.
      Scrimmage.
      Punting.
    e. Rules.
    f. Restrictions.
    g. Scoring.
      Touchdown.
      Goal.
      Field goal.
      Safety.

II. ANCIENT.
  1. Rome.
  2. Greece.

III. MODERN.
  1. United States.
    a. Participants (colleges and universities chiefly).
    b. Season.
    c. Places of contest.

2. England.
    a. Rugby.

IV. VALUE.
1. Sporting.
2. Hygienic.
    Strength, endurance, speed, agility, quickness of thought, etc.
3. Moral.
    a. Sense of honor quickened.
    b. Body brought to perfection.
    c. Temperance, self-denial, etc.

QUESTIONS.

If you were making application for membership to an important football team what requirements would you have to possess to be accepted?

How does football compare in popularity with baseball? Is it known as a national game?

What is now the length of a football half?

At what season is the game played in the United States, and as a rule by whom?

What is meant by the terms: touchdown, quarterback, halfback, coach, etc.?

What late movement has resulted in eliminating unnecessary violence and liability to injury?

What are the points in favor of this game? In what manner is it particularly beneficial to the participant? To the spectator?

What national holiday in some parts of the United States marks the closing of the football season?

Name physical qualities necessary for one to participate in this game.

What is said to be the national game of the United States?

What nation apparently seems to be leading in athletics?

What outdoor game is adapted to both sexes?

Cricket is the national game of what country?

Why does golf recommend itself as an outdoor game?

What sports are followed in connection with water?

Give reasons for outdoor sports gaining in popularity. Where is this especially true? What good results will follow?

Aside from pleasure what benefits accrue from rowing? Swimming? Tennis? Skating? etc.

How do the schools regard this subject? What are some of the late developments along this line?

Compare the games of ancient with those of modern days in their effect on health, intellect and morals of the nation.

Mention games whose chief instrument is the ball, boat, gun, horse, etc.

What are some of the far-reaching effects on a nation whose people engage in outdoor recreation?

Are interest and enthusiasm necessary in what is known as gymnastics in our common schools? Why?

"To impose on a child to get by heart a long scroll of phrases without any ideas is a practice fitter for a jackdaw than for anything that wears the shape of a man."

A little library growing larger every year is an honorable part of any child's history.
—*Henry Ward Beecher.*

Biography

We now call your attention to a department of school work which appeals to every true teacher and to every wide-awake boy and girl, the department of Biography. The educators who planned this work realize how intensely interesting the lives of great men and women are to young people, in fact to every one.

We include with these biographies portraits of many of these eminent people whose unselfish lives must forever remain an inspiration to others.

Particular attention has been paid to adapting it to the wants of American readers and of the present time. It will be found that many names are included of persons recently brought into prominence who are the subject of daily inquiry in this country but of whom no mention can be found in the more pretentious and bulky reference works.

We give over 3,500 biographies. It has been the endeavor of the editor to make the collection so complete that this biographical information will answer every demand made upon it by the student, and the great extent of the work makes it possible in this course to merely indicate a brief classification which if chronologically arranged would present a history of human activity in the field of art, literature and science.

In the following biographical outline we have merely noted a few names in connection with the classification. This list may be added to as you refer to The New Practical Reference Library. In the biographies you will find the most salient points in each career have been touched, and no person can arise from a perusal of such lives without feeling his whole mind and heart made better and his best resolutions strengthened; thus it is impossible to say where a good example may not reach, or where it will end, if indeed it have an end.

Classified List

Actors—Garrick, Irving, Booth, Bernhardt, Mansfield, Marlowe, Adams.

Adventurers and Discoverers—Columbus, Abruzzi, Cortez, Livingstone, Magellan, Stanley, Drake, Kidd, Peary, Nansen.

Alchemists—Agrippa, Bacon, Paracelsus, Lavoisier, Priestly.

Americans, Great—Franklin, Henry, Washington, Lincoln, Garfield, Lee, McKinley.

Anti-Slavery Leaders—Wilberforce, Garrison, Phillips, Fremont, Stanton.

Artists—Giotto, Schnorr, Ruysdaal, Copley, West, Vinci.

Astronomers—Herschel, Tycho Brahe, Kepler, Newton, Young, Halley, Laplace, others.

Authors—Homer, Dante, Luther, Shakespeare, Chaucer, Bacon, Milton, Goethe, Cervantes, Scott, Dickens, Tennyson, Kipling, Irving, Bryant, Longfellow, Howells, Twain, Riley, Aldrich, others.

BIBLE CHARACTERS—David, Jews, Paul, Moses, Jesus, God, Abraham, John, etc.
BOTANISTS—Huxley, Tyndall, Humboldt, Burbank, Pliny, Ray, Linnæus, Brown, Gray.
CHEMISTS—Priestly, Cavendish, Dalton, Humboldt, Faraday, Professor and Madam Curie, Pasteur.
COLONISTS—Drake, Raleigh, Smith, DeSoto, Balboa.
CONFEDERATE STATESMEN—Davis, Stephens, Breckenridge, Benjamin, others.
DETERMINATION, MEN OF—Palissy, Galileo, Burritt, Carlyle, Bunyan, Arkwright.
DILIGENCE, MEN OF—Buffon, Jenner, Franklin, Wellington, Irving.
DIVINES—Abbott, Beecher, Campbell, Moody, Parker, Sankey, Talmage, Hillis, Gunsaulus.
DRAMATISTS—Jonson, Dumas, Schiller, Æschylus, Ibsen.
ENGLISHMEN, GREAT—Grey, Elizabeth, Cromwell, Anne, Pitt, Victoria, Gladstone, Balfour.
ENGLISH WRITERS—Bacon, Chaucer, Caxton, Gibbon, Ruskin, Tennyson.
FINANCIERS—Patterson, Rothschild, Morris, Gage, Morgan, Carnegie, Sage, Rockefeller, Shaw.
HISTORIANS—Plutarch, Herodotus, Macaulay, Gibbon, Parkman, Guizot, Hume, Bryce.
ILLUSTRATORS—Darley, Nast, Cruikshank, McCutcheon, others.
INTEGRITY, MEN OF—Diogenes, Burke, Arnold, Jackson, More, Wilberforce.
INVENTORS—Davy, Fulton, McCormick, Vinci, Edison, Marconi, Tesla, Maxim, Noble.
JOURNALISTS—Franklin, Greeley, Bennett, Dana, Watterson, Young, Pulitzer, Medill.
KINGS—Charlemagne, Cæsar, Alexander, Bonaparte, Henry VIII, George III, Edward VII.
LAWYERS—Moses, Confucius, Lycurgus, Blackstone, Webster, Solon, Knox, Choate.
LIBRARIANS—Poole, Spafford, others.
LOGICIANS—Mill, Hegel, Kant, Leibnitz, others.
MATHEMATICIANS—Pythagoras, Archimedes, Legendre, Newton, Gunter, Lord Kelvin.
MERCHANTS, FAMOUS—Law, Hudson Bay Co., Astor, Girard, Morris, Wanamaker, Field.
MISSIONARIES—Xavier, Elliot, Moffat, Livingston, John the Baptist, Jesuits.
MUSICIANS—Patti, Lind, Beethoven, Mendelssohn, Strauss, Paderewski, Wagner, Mozart, Kubelik.
NOBLE MOTIVES, MEN OF—Lincoln, LaFayette, Garrison, Whittier, Greeley.
NOVELISTS—Balzac, Andersen, Bjornson, Cooper, Dumas, Tolstoi, Stevenson, Eliot, others.
ORATORS—Demosthenes, Cicero, Antiphon, Burke, Henry, Webster, Bryan, Beveridge.
PAINTERS—Michelangelo, Titian, Rembrandt, Raphael, Correggio, Burne-Jones, Whistler, Sargent, Murillo, others.
PATIENCE, MEN OF—Columbus, Hampton, Raleigh, Kossuth, Audubon, Harvey.
PATRIOTS—Bruce, Washington, Moore, Pitt, Gladstone, Davis, Kosciusko, Joan of Arc.
PHILANTHROPISTS—Barnardo, Childs, Cooper, Durant, Hirsch, Girard, Peabody.
PHYSICIANS—Hahnemann, Virchow, Harvey, Pasteur, Senn, Lorenz.
POLITICAL ECONOMISTS—Mill, Martineau, Franklin, Bagehot.
PREACHERS—Chrysostom, Kempis, Xavier, Wycliffe, Wesley, Spurgeon, Moody.
PRECISION, MEN OF—Poussin, Cuvier, Titian, Brougham, Pope, Disraeli.

PRESIDENTS—(See them.)
PRINTERS—Gutenburg, Caxton, Elzevir, others.
PRISONERS' FRIENDS—Vassar, Howard, Fry, Nightingale.
PSYCHOLOGIST—Aristotle, Berkely, Cousin, Hegel, Hume.
REFORMERS—Stanton, Anthony, Blackwell, Bloomer.
RELIGIOUS LEADERS—Wycliffe, Luther, Calvin, Abbott, Parkhurst.
RULERS—Alexander, King Edward, Loubet, Diaz, Nicholas II.
SCIENTISTS—Harvey, Gesner, Ray, Buffon, Cuvier, Agassiz.
SCULPTORS—David, Raphael, Hosmer, Powers, Greenough, Donatello, Thorwaldsen, Phidias, Bartholdi, Saint Gaudens.
SOCIAL REFORMERS—Adler, Bradlaugh, Gerry, Debs, Addams.
SOLDIERS—Hannibal, Cæsar, Cromwell, Grant, Jackson, Lee.
STATESMEN—Bolingbroke, Bismarck, Davis, Gladstone, Lincoln, Blaine.
TEACHERS—Quintillian, Erasmus, Pestalozzi, Mann, Murray, Parker.
TEMPERANCE ADVOCATES—Gough, Willard, others.
THEOLOGIANS—Zwingli, Luther, Xavier, Huss, Campbell, Beecher.
WARRIORS—Washington, Bonaparte, Alfred the Great, Charlemagne.
WOMAN SUFFRAGISTS—Stanton, Mott, Anthony, Bloomer.
YOUNG MEN, GREAT—Handel, Haydn, Mozart, Cervantes, Pope.

Famous Women

Among the many famous women whose biographies are included in THE NEW PRACTICAL REFERENCE LIBRARY we submit the following list for your study:

Adams, Maude.
Addams, Jane.
Alcott, Louisa May.
Anthony, Susan B.
Aspasia.
Austen, Jane.
Barton, Clara.
Bernhardt, Sara.
Bonheur, Rosa.
Bremer, Fredrika.
Bronte, Charlotte.
Browning, E. B.
Burdett-Coutts, Baroness.
Cary, Alice and Phoebe.
Catharine de Medici.
Catharine, Empress.
Cenci, Beatrice.
Christina, Queen.
Corday, Charlotte.
Dudevant, Mme.
Eliot, George.
Elizabeth, Queen.
Gould, Helen.
Grey, Lady Jane.
Howe, Julia Ward.
Hypatia.
Lind, Jenny.
Joan of Arc.
Marlowe, Julia.
Marie Antoinette.
Maria Theresa.
Nightingale, Florence.
Ossoli, Margaret Fuller.
Patti, Mme.
Pocahontas.
Roland, Mme.
Sappho.
Stael, Mme. de.
Stowe, Harriet B.
Victoria, Queen.
Victoria, Queen.
Ward, Mrs. Humphry.
Washington, Martha.
Wilhelmina, Queen.
Wilkins, Mary.
Willard, Frances E.

QUESTIONS.

How old was Queen Victoria when she ascended the throne? How many years did she reign? When and at what age did she die?

At what age did Wilhelmina become queen of the Netherlands?

In what field of labor did Frances Willard become world famous? Where was she born? Educated?

Was Emma Hart Willard, who wrote "Rocked in the Cradle of the Deep," related to Frances Willard?

What are some of the principal productions from the pen of Mrs. Humphry Ward?

What was George Eliot's real name? In what story does she portray her girlish personality? At what age did she marry?

What names have made the reign of Elizabeth one of the most famous literary periods of all time?

What national association was organized by Susan B. Anthony? Who worked with her in this movement?

What painting by Rosa Bonheur was purchased for $55,000 by Cornelius Vanderbilt?

Of what descent is Sarah Bernhardt? By whose wish was she baptized into the Christian faith?

In what year did Louisa M. Alcott write her famous "Little Women"?

What poem by Elizabeth Barrett led to her marriage to Robert Browning?

For what work is Jane Addams famous?

In what production did Maude Adams score a great success and win much of her present fame?

What famous hall was presented to a great university by Helen Gould?

For what are Alice and Phœbe Cary celebrated?

Who was Hypatia? What led to her brutal murder by the clergy?

When and where was Julia Marlowe born?

QUESTIONS—BIOGRAPHY.

Actors and Dramatists.

How is Henry Irving regarded as an actor?

Of what nationality is Ellen Terry? How does she rank as an actress?

In what world-famous play did Joseph Jefferson take the leading part? How is he regarded by the American people? What is his rank as an actor?

In the presentation of what plays did Edwin Booth win fame?

What is the nationality of Bernhardt? For what lines of work is she noted other than acting?

What are the principal dramas of Shakespeare presented today?

Artists.

How does Rosa Bonheur rank as an artist? When did she die?

What was the last and unfinished painting of Raphael?

Is Dante Rossetti more famous as a poet or painter?

How many paintings has Rubens produced?

What picture by Titian has been described as faultless?

What are Raphael's greatest works? Name three.

What is Vandyck's rank among portrait painters?

For what extraordinary sums were Rembrandt's "Coppenol" and "Jesus Before Pilate" sold?

What sculptor made the statue of "Liberty," overlooking New York harbor?

Business and Industrial.

Over what immense number of miles of railway was Jay Gould once in command?

What great sum was paid by Barnum for "Jumbo," the huge elephant?

Who is James J. Hill? What has he accomplished in his line of work?

What can you say of Alfred Krupp? For what is he noted?

What is the record of Marshall Field along commercial lines?

At what age did Rockefeller enter business and when did he become head of the Standard Oil Company?

What famous search mission was undertaken at the suggestion and expense of James Gordon Bennett?

How did it happen that the new continent was named after Amerigo Vespucci?

Where did Andre start on his balloon expedition to the North Pole? What was the result?

In what cool way did Balboa appropriate the Pacific?

What were the education and the early tastes of Christopher Columbus?

Which was the most famous of Drake's voyages?

How was Vasca da Gama rewarded by the Portuguese government for being the first to round the Cape of Good Hope?

How did Livingstone and Stanley divide the field of discovery?

How much nearer the pole than any previous explorer did Nansen arrive?

What are the dates of Peary's three Arctic expeditions?

From what very humble origin did Livingstone make his way to fame?

Name some of the notable events in the career of Daniel Boone.

Educational.

What rank does William R. Harper take as an educator?

Along what lines is Booker T. Washington working in the education of the negro?

Of what subject was Frances Willard a professor in Northwestern University?

For what is Euclid noted? Sir Isaac Newton?

What was the original endowment fund of the Astor Library, and what is the size of the library?

For what is Leland Stanford's name noted?

How did Aristotle believe happiness is attained?

What was the great good in life and the great evil according to Epicuris?

For what is William T. Harris distinguished?

Of what famous university is Arthur T. Hadley the head?

Of what university is James B. Angell president?

What is the plan of the Carnegie Institution? Where is it located?

Who founded Harvard University and when?

Who was Horace Mann? Frances Parker?

What university has for its head E. Benjamin Andrews? David Starr Jordan? Woodrow Wilson? Edmund J. James? Cyrus Northrup? Jacob Gould Schurman?

Historical.

At what unusual age did George Bancroft enter college and receive his doctor's degree?

What were the various stages of emancipation?

From what social class was Washington descended and how long had his family been in America?

Where did Croesus obtain his proverbial wealth?

Who was Aurelius Antonius?

What was the career of Caius Marius?

What is the story of Romulus and Remus?

For what was Alfred the Great especially noted?

When did Kitchener leave Sudan?

What was the unusual combination of characteristics in Tiberius' reign?

Who were the parents of Frederick Douglas and what was his early mode of life?

What was the treaty which bears John Hay's name?

What was the far-reaching object of Lycurgus?

What repeated penalties did William Penn suffer for his Quaker opinions?

For what parliamentary acts was Sir Robert Peel celebrated?

What were the great events in Oliver Cromwell's life?

Who was Chinese Gordon or Gordon Pasha?

Who was Robin Hood and his followers?

What is the story of William Tell?

What Presidents of the United States have been assassinated?

Inventors.

Where was the first locomotive engine made in the United States and from whose plans was it constructed?

How is the story of Thomas Edison's life typically American?

What is the great invention of George Westinghouse?

What American ship famous in the Civil War was invented by Ericsson? What effect did it have on naval warfare?

When did Howe invent the sewing machine?

What machine invented by Eli Whitney has been the means of the saving and making of millions of dollars every year?

Is Bell, the inventor of the telephone, still living?

Who is Marconi? What is his important discovery?

Literature.

(For more extended list of writers and authors see Literature.)

What is regarded as Victor Hugo's best novel?

Of what nationality is Tolstoi?

What is the nature of Mark Twain's writings?

Who is Jacob Riis? What are some of his best books?

With what paper was Joel Chandler Harris connected for more than twenty years?

Why is Edward Everett Hale called "the American Defoe"?

Of what nationality was Ibsen? Tell of his life and works.

For what humble trade did Whittier prepare himself?

Religious.

At what early age did Moody begin his evangelical work?

In what capacity has Dr. Parkhurst earned his fame as a social reformer?

What life did Peter the Hermit lead after the Crusades?

For what is Robert Raikes noted?

With what university is Emil G. Hirsch connected? For what is he famous?

Who was John Huss? What noted article did he write?

What was the appearance and personality of Phillips Brooks?

Who protected Calvin after he had turned heretic to the Roman Catholic faith? How did the Calvinist sect arise?

From what circumstances arose the term "Quakers"?

What famous duel was made the subject of one of Lyman Beecher's most noted sermons?

Of what religion was Zoroaster the founder?

Of what famous educational assembly is Bishop Vincent the founder?

Who was Savonarola?

To what form of religion did Voltaire hold in denouncing Christianity?

In what way was the Society of Jesuits formed?

When did Leo XIII become pope and how many years was he at the head of the Roman Catholic church?

For what is Bishop Ireland noted? Bishop Spalding? Cardinal Gibbons?

What distinction did the Methodist Episcopal church bestow upon Francis Asbury?

In what year did Dowie announce himself to be "Elijah the Restorer"?

At the head of what great religious and charitable movement is William Booth?

Musicians.

What rank does Jan Kubelik take as a violinist?

From what common affliction did Handel and the poet Milton suffer?

To what king was Mendelssohn appointed musical director?

What honor was conferred upon Mozart at the age of six?

What is Mme. Nordica's nationality? What is her rank as a singer?

When was Sousa's band first organized?

For what is Antonio Stradivari noted?

Thomas was the musical director in what noted fair?

From what did Wagner select his subjects?

How is Chopin pronounced?

Military and Navy.

In what war did Grant serve in every battle but one?

In what tragic way did Montezuma bring death upon himself?

What did General Grant owe to Richard Yates?

Where was General Custer defeated and killed and what commemorates the spot?

What part did Rear Admiral Schley play in the war with Spain?

When did Dewey become an admiral?

When did General Weyler leave Cuba?

When did Funston capture Aguinaldo?

Who is Captain Dreyfus? What persecutions has he been subjected to and why?

Who commanded the Invincible Armada?

In what famous battle were the Confederate forces successful under the leadership of Bragg?

What Japanese leaders won fame in the Russo-Japanese war? What Russian leaders?

In what lay Lee's wonderful military genius?

Miscellaneous.

For what is Lyman Abbott noted?

What is the Hall of Fame? Names of what noted Americans have been inscribed? What are the conditions imposed?

Who is Luther Burbank? What is his particular line of work?

How does Hull House rank in the institutions of its kind in the United States? Who is at its head?

For what is Henry George noted? To what extent, if any, have his ideas been adopted?

Sir Christopher Wren restored what celebrated cathedral?
How did Chester A. Arthur serve in the Civil War?

Philanthropists.

What is the wide range and importance of George Peabody's philanthropic work?

What famous simile did John Locke make in describing the human mind?

What enormous gifts of money have been donated by Carnegie and for what purposes?

What were some of the contributions of George Peabody in the cause of education? What is the Peabody Educational Fund?

What is the college founded by Stephen Girard to which ministers are denied entrance? Where is it located?

How many boys and girls were educated by George William Childs?

What generous aid did Cecil Rhodes give to the Irish Home Rule cause?

Philosophers.

In what direction has Hegel's philosophy made itself most powerfully felt?
What was Plato's philosophy? Who were the Seven Wise Men?
What was Galileo's most important discovery? For what was he persecuted?
What system of philosophy did Auguste Comte found?
What was Socrates' method of arriving at the truth?

Political.

For what reason did McKinley receive more than the average vote of his party in 1896?

For what was Cleveland's second administration memorable?

At what very early period did Martin Van Buren enter political life?

How did James Garfield's unexpected nomination for the presidency come about?

In what dramatic episode was Henry M. Teller the leader?

Was Mark Hanna largely responsible for placing McKinley in the presidential chair?

How many years has Joseph G. Cannon served in Congress?

Of what party was John C. Breckenridge once the candidate for the presidency? What was his rank in the Confederate army?

How many times was Henry Clay defeated for the presidency? What is his famous saying in this connection?

When did Chauncey Depew retire from a railroad presidency?

Give an account of the public career of Theodore Roosevelt.

Rulers.

For what is Abdul Hamid noted?

For what reasons was Marie Antoinette unpopular with the French populace?

When was the title "Empress of India" conferred upon Queen Victoria?

Who is the present king of Denmark? Of Norway? Whom did the latter succeed?

Who was the father of Queen Christina of Sweden and who directed her unusually broad education?

Which of the Russian rulers named Ivan was called "The Terrible"?

Who was the greatest king of Scotland, and why?

Over what celebrated woman did Mary I triumph in ascending the throne?
What is the meaning of "Hapsburg"?
Who is the present ruler of Holland?
Who was Queen Elizabeth's mother?
Who is the sultan of Turkey? Tell of his relations with other countries.
Why was George IV given the nickname of "First Gentleman of Europe"?
What are the characteristics of the czar of Russia?

Statesmen and Orators.

In what two cabinets has Horace Porter served?
When did John Sherman resign his position as secretary of state?
Who was at the head of the war department during Lincoln's administration?
What principle dominated Webster through all his political life?
What was Gladstone's public career?
How long was Lord Rosebery premier of England?
Compare personal characteristics of Roosevelt and McKinley.
How is John Hay regarded as a diplomat?
Who was Paul Kruger? For what principles was he fighting? What were his characteristics?
Who is Ito? What is he doing for his country? In what way has the United States helped him?
What were the leading characteristics of Webster?
What relation to Napoleon is Secretary of the Navy Bonaparte?
Who is La Follette? For what work is he prominent?
What speech resulted in the nomination of Bryan to the presidency in 1896?
What were some of the characteristics of Beecher as a speaker?

Patriotic.

In what way did Congress make recognition of LaFayette's services?
What is the interesting memorial in honor of Kosciusko?
Who was Robert Emmet? For what was he executed?
What part in affairs of Colonial times did Patrick Henry take? What is his famous saying?
For what was Joan of Arc noted?
In what way did Florence Nightingale serve her country?
Who was James Lawrence? When did he utter the famous words: "Don't give up the ship"?

Scientific.

For what is Pasteur noted? Professor and Madam Curie?
By whom was radium discovered?
What is liquid air and its uses? Who has been the most successful experimenter with it?
What are the principles on which the thermometer works? The barometer? Who invented each?
Who is Hiram Maxim and for what is he noted?
What deadly explosive was invented by Alfred Nobel? What are the Nobel prizes?

All that mankind has done, thought, or been is lying as in magic preservation in the pages of books. —*Carlyle.*

Botany

To enable the student to use intelligently the systematic and classified index embodied in THE NEW PRACTICAL REFERENCE LIBRARY, we supply herewith an outline on BOTANY which includes only those titles actually reached by way of the title BOTANY. To make the matter clear: If a person reads the article on BOTANY he would be referred to the article on PLANTS. When he reads the article on PLANTS he will be referred to the articles on STEMS, LEAVES, FRUITS, etc. He may then return to the article BOTANY, and will find a cross reference to CLASSIFICATION. Under CLASSIFICATION he will find cross references to GENUS, SPECIES and VARIETY. When he has read these he will return to the article BOTANY, find articles on SLIME MOLDS, DIATOMS and BACTERIA. In the last named he will find references to PUTREFACTION, FERMENTATION, etc., with a reference which leads into MEDICINE. Running down the page to cross reference 14, you will note CONIFERÆ. Under this the several important cone-bearing trees are mentioned by name. Note that under PINE you will be led into the products of pine, which carries you into LUMBER and FORESTRY, where you might find still further cross references.

A systematic outline like this on BOTANY shows to the eye very clearly what a valuable and thorough-going index we have in our cross references and how very interesting, work of research may become by using THE NEW PRACTICAL REFERENCE LIBRARY.

BOTANY.

1. Plant
   - (a) Stems
   - (b) Leaves
   - (c) Fruits
   - (d) Flowers
   - (e) Pollen
   - (f) Seeds
2. Classification
   - (a) Genus
   - (b) Species
   - (c) Variety
3. Slime Molds
4. Diatom
5. Bacteria
   - (a) Putrefaction
   - (b) Fermentation
   - (c) Antiseptics
     - (1) Surgery
     - (d) Germ Theory of Disease
     - (e) Medicine
6. Molds
7. Rusts
8. Yeasts
9. Algae
10. Lichens
11. Mosses
12. Ferns
13. Club Moss
14. Coniferae
    - (a) Cypress
    - (b) Fir
    - (c) Hemlock
    - (d) Larch
    - (e) Pine
      - (1) Tar
      - (2) Turpentine

(3) Forests
(a) Forestry
(4) Lumber
(a) Saw
(f) Sequoia
(1) Redwood
(g) Spruce
(h) Yew
15. Cycads
16. Grasses
17. Palms
(a) Cabbage Palm
(b) Cocoanut
(c) Date
(d) Doum Palm
(e) Ivory Palm
(f) Palmetto
(g) Palmyra Palm
(h) Sago
(i) Talipot Palm
18. Lily Family
19. Orchids
20. Cruciferae
(a) Mustard Family
21. Leguminosae (Pulse Family)
(a) Indigo
(b) Peanut
(c) Bean
(d) Cassia
(e) Acacia
(f) Clover
22. Labiatae (Mint Family)
23. Compositae
(a) Arnica
(b) Aster
(c) Chrysanthemum
(d) Dahlia
(e) Daisy
(f) Goldenrod
(g) Lettuce
(h) Tansy
(i) Thistle

Flowers

I. Uses.
1. Primary.
a. Produce seeds.
2. Secondary.
a. Beautifying earth.
b. Commercial purposes.

II. Parts.
1. Calyx.
2. Corolla.
3. Stamens.
a. Filament.
b. Anther.
c. Pollen.
4. Pistils.
a. Ovules.
b. Stem-style.
c. Stigma.

III. Variations.
1. Construction.
2. Forms.
3. Colors.

IV. Cultivation.
1. Methods.
a. Landscape gardening.
b. Conservatories, hot houses.
c. Nurseries, etc.

V. National and State Flowers.
1. Significance.
a. Denote feelings and characteristics of nations.
b. Influence.
2. Countries.
a. United States.
b. Foreign countries.

VI. Language of Flowers.

VII. Commercial.
1. Manufacture of artificial flowers.
2. Supplying markets with shrubs and flowers.

VIII. Colored Plate.

QUESTIONS.

What is the great fact in the life of the flower?

Why is it necessary that birds and insects should be attracted to the flowers? By what means are birds and insects so attracted?

From the color plate illustrating flowers, how many varieties do you find common to your garden? To your nearest greenhouse?

Name and describe a dozen different kinds of flowers of your neighborhood.

How many thousand species of orchids are known?

Where do orchids grow wild in the forests?

What are some of the peculiar shapes of orchids?

What city leads in the manufacture of artificial flowers?

Just from your everyday observation, for what would you say artificial flowers were most generally used?

When and where did the Language of Flowers originate?

What is your state flower?

What is the calyx?

Why is the corolla usually highly colored?

Where do you find the pollen in the flower and of what use is it?

From what country does the lotus come?

What do the natives of India believe of the lotus?

What flower is the emblem of Persia?

What country has the fleur de lis for a national flower?

What is the national flower of the United States? How and when was it selected?

What flower often assumes the forms of reptiles and insects?

From what flower do we get the vanilla?

What flower is the emblem of Japan?

How are the state flowers adopted?

What is the state flower of West Virginia? Of Louisiana? Of Indiana? Of New York? Of Kansas?

What species of the chrysanthemum are common weeds in Britain?

Of what was the daisy the emblem in the days of chivalry?

What is the universal significance of the forget-me-not?

What is the popular name of geranium?

What ancient people sent holly with New Year's gifts as emblems of good will?

Where has ivy been held sacred?

Narcissus, according to the Greeks, was changed into what flower?

What kind of plant is the sun dew?

Of what was the myrtle an emblem at Athens?

QUESTIONS—BOTANY.

Who is the Father of Botany?

In what way did Darwin's theories and discoveries revolutionize botany?

Of what plant in particular did he make a study?

What is pollen? Why is it produced in such abundance? How do insects help in the fertilization of flowers?

What are some of the methods by which seeds are scattered? Why are they produced in such abundance?

What are parasites in the plant world? Give examples.

Give uses of the following to plant life and describe their functions: Roots, stems, leaves, flowers.

What instrument aids materially in the study of botany?

Why are leaves arranged on a plant in a certain order and always to what end?

What is chorophyll? What important work does it do for the plant? What is meant by saying plants take in carbonic acid gas and give off oxygen?

What is meant by germination? Upon what does it depend?

How many different species of palms are there? What are their main characteristics? Name three well-known varieties.

What is the meaning of the word "coniferæ"? Describe the general characteristics of the pine family.

What foods are produced by the leguminosæ order?

What common vegetables are produced by the mustard family or cruciferæ?

Of what aid are bacteria to plant life? What injury?

Where are lichens found in greatest variety? What is their chief use? Describe their growth.

What are fungi? Characteristics? Number of species?

How many known species in the family compositæ? Of what do they consist?

What are the principal uses of moss? Where grown?

Why are orchids favorite plants? Where are they found?

How do the following injure the plant: Molds, rusts, fungi, etc.?

What are cotyledons? Dicotyledons? Monocotyledons?

What is known of the diseases of plants? What havoc do insects and worms play in the plant world?

Perhaps you are excusing yourself for not buying books on "the insufficiency of your income." But do you not spend for other things, entirely unnecessary, much more every year than the cost of a few books? The immediate outlay need not be large; the returns which you will realize will be great in proportion to your good judgment and earnestness. Not only will the possession of a good library add to your enjoyment and increase your capacity for doing good; it may, if you are worldly minded—and we all are—put you in the way of occupying a more desirable position and earning a more satisfactory reward for your labors. —*James Baldwin.*

Chemistry

That we should have at least a practical knowledge of the elements necessary to life, the air we breathe, the food we eat, will go unquestioned. An elementary knowledge of chemistry is of prime importance to the housewife, to the farmer, and the layman in every walk of life. The science of chemistry enters into every branch of study.

The boy with an active mind has inquired the cause of cream forming on milk; he wonders what causes gas to burn: smoke to rise: water to freeze: how matches are made; in fact he is daily confronted with subjects on which his mind hungers for enlightenment. He should have means of appeasing and at the same time developing this natural appetite. To form the habit of looking up daily such subjects will lay a permanent foundation to a broad, practical education.

In the preparation of THE NEW PRACTICAL REFERENCE LIBRARY this idea was constantly kept in mind, and throughout the work will be found an inexhaustible fund of such information, written in simple, clear language. In the accompanying outline no effort has been made to go into detail. A brief list of related subjects is appended. The student will find hundreds of others. It must be borne in mind that the value of this course of study, as any other, lies in the fact that the user is led to search for the knowledge sought and is only rewarded when honest effort has been made.

CHEMISTRY.

What is chemistry? Of what does it treat?

HISTORY.

- Alchemy (which see).
  - Objects.
    - Prolongation of life.
    - Transforming baser metals into gold.
- Egypt.
- Arabia.
- Europe.
  - Results.
    - Paracelsus—Discovered preparation of drugs.
    - Lavoisier, Priestly, Scheele } By use of balances established modern ideas of chemistry.

GREAT CHEMISTS (which see).

Sir Humphrey Davy	Faraday	Pasteur
Berzelius	Gay-Lussac	Priestly
Bacon	Lavoisier	Others
Boyle	Liebig	

Is chemistry an ancient or modern science?

What was alchemy? What were its two chief objects? What science did the study of alchemy develop?

In what ancient country is it thought the study of alchemy began?

What alchemist developed the manufacture of drugs, and when?

What other students of alchemy by the use of balances laid down the principal ideas of modern chemistry?

SUBSTANCE.

Element—Define.

Examples.

Aluminum.	Copper.
Arsenic.	Gold.
Calcium.	Iron.
Carbon.	Lead, etc.

Compound—Define.

Chemical affinity.

Atomic theory.

How many elements were known to chemistry in 1906?

What is the force called that holds elements together in the form of compounds? What other action does this force bring about?

What is an atom? A molecule? Is a drop of water an atom or a molecule? Why?

LAWS OF CHEMICAL COMBINATION.

Effects a change of

State.	Volume.
Temperature.	Taste.
Color.	Smell.

Affected by

Heat.	Electricity.
Light.	Mechanical force.

When does chemical combination take place between molecules? Give an example.

Does chemical combination take place with different degrees of force in different bodies?

What is peculiar about the combination of all substances as regards weight and proportions?

How do gases combine?

NOMENCLATURE.

Endings applied to

Metals—

um.

Compounds—

ide. ous. ic. ite. ate.

To what do some elements in chemistry owe their names?

What is the modern custom of naming metals? Compounds? Give example.

Do the names of many compounds denote their composition? Give three examples.

When does the name of an element end in *ous*? In *ic*?

SYMBOLS.

Used to represent

Elements.

Compounds.

Chemical reaction.

BRANCHES OF CHEMISTRY.

Organic.	Industrial chemistry.
Inorganic.	Physical chemistry.
Agricultural.	Thermochemistry.
Electrochemistry.	

Some of the many related subjects are here listed. These will be found in THE NEW PRACTICAL REFERENCE LIBRARY:

Hydrogen	Ice	Ozone	Paints	Soda	Coal-tar
Nitrogen	Zinc	Cobalt	Phosphorus	Oils	Dyeing
Oxygen	Gold	Nickel	Aluminum	Alum	Gums
Potassium	Silver	Sulphur	Tin	Acids	Resins
Water	Iron	Radium	Borax	Brass	

QUESTIONS—ELEMENTARY CHEMISTRY.

How do you account for carbonic acid gas being poisonous to the lungs but pleasant and stimulating to the stomach?

What is soda water? With what is it charged?

How is the cream on milk formed?

From the bark of what tree is quinine made? When was it discovered? For what ailments is it helpful?

What is chloroform? When and by whom was it discovered? When and by whom was it first used as an anesthetic? How is it administered? What are its effects?

For what is ether extensively used?

Name some of the remarkable and valuable discoveries made by Sir Humphrey Davy.

What is ozone? Where does it exist? When is its odor noticed?

How is opium used in certain countries as an intoxicant? Under what name is it commonly used in medicine? Describe it in its natural state. From what country is the principal supply obtained? What beautiful flower in your own garden produces it?

What are some of the most common food adulterants? Name five?

How and from what is gunpowder made? What ancient people used it? When was it first used in war?

Does German silver contain any silver in its composition?

What is the difference between powder used for rifles and that used for blasting and for cannon?

What is smokeless powder? Who discovered dynamite? Nitroglycerin? Guncotton? Which has the greater explosive power, nitroglycerin or dynamite?

What is sulphur? Is it a vegetable or mineral? Where is it found? What are its principal uses? What useful and necessary little article is made from it and used in your home daily?

When were matches first used? How were they lighted?

How can you detect the presence of ammonia and alum in baking powder?

What part of air is oxygen? Nitrogen? Do these gases unite?

NOTE.—How large is an atom? Lord Kelvin says: "If we raise a drop of water to the size of the earth and raise the atom in the same proportion, then it will be some place between the size of a marble and a cricket ball." John A. Brashear in an address delivered at Lehigh University not long ago added: "If you fill a tiny vessel one centimeter cube (smaller than a thimble) with hydrogen corpuscles, you can place therein, in round numbers, five hundred and twenty-five octillions (525,000,000,000,000,000,000,000,000,000) of them. If these corpuscles are allowed to run out of the vessel at the rate of 1,000 per second it will require seventeen quintillions (17,000,000,000,000,000,000) of years to empty it.

What is the atmospheric pressure in tons on the human body of average size? How is this enormous pressure counterbalanced?

Why is milk one of man's most perfect foods?

In the manufacture of illuminating gas, what impurities must be removed? How is coal gas made? Water gas?

How many gallons of vinegar can be made from a bushel of corn?

Oxygen

Distribution.	Essentials.	Peculiarities.
a. In water.	a. To rocks.	Odorless.
b. In air.	b. To minerals.	Invisible.
c. In silica.	c. To tissues.	Tasteless.
d. In chalk.	d. To blood.	Least refractive.
	e. To light.	Most magnetic.
	f. To heat.	

TEST QUESTIONS ON OXYGEN.

When and by whom was oxygen first discovered?

When and how was it first liquefied? Solidified?

How much heavier is oxygen than air?

Is oxygen necessary to all processes of respiration?

Without its presence would animal matter, after death, disintegrate?

How is oxygen distributed through the body? Describe the process in detail.

How do trees and plants give off oxygen?

In what other form, and by what name, does it exist?

How is it administered as a medicine?

What per cent of oxygen is found in air? Water?

Would death result if the supply of oxygen ceased?

Give three instances in everyday life where we come in practical touch with oxygen.

A pure, fresh book for a little child is a treasure to be sought for and appreciated. A good book presented to a child on each succeeding birthday—a book chosen wisely with respect to the child's tastes and abilities, but of sterling worth, will soon put him in possession of a library which will be a lasting source of strength and satisfaction.

—Walter Taylor Field.

What is put into the first of life is put into the whole life. Start right. —*Colton.*

Civil Government

Few subjects are of greater importance to the boys and girls than a correct understanding of the workings of our governmental machinery.

This subject should be developed from the immediate district or township and a thorough understanding of the primary principles will do much toward an understanding of the subject as applied to nations.

In classes of sufficient size, ideas of government can be practically illustrated by organizing them into caucuses, conventions, courts, etc., by holding elections, creating offices and showing the pupils how to perform the duties thereof.

The schools have given far too little attention to this important subject. Many of the political evils so prevalent are largely due to the fact that CIVICS is not taught until in the high school or college.

The only way to respect and love the Constitution is to *know* it. Citizens should know the obligations imposed upon them. Electors should realize the importance of their vote; taxpayers should comprehend the use made of their money, and all should be taught to love our country and her laws.

If ideas of true citizenship be early taught and the children are led to appreciate the inestimable birthright of American citizenship, patriotism will be fostered, political corruption checked and wise government well founded.

Constitution

I. DEFINITION—Supreme law of the land.
II. FORMATION.
    1. Time—September 17, 1787.
    2. Place—Philadelphia.
    3. Manner—By Federal Convention.
    4. Difficulties.
III. EFFICIENCY—Compared with Articles of Confederation.
    1. The central government had more power.
    2. The powers and functions were more widely distributed—legislative, executive and judicial.
IV. PURPOSES.
    1. To form a more perfect union.
    2. To establish justice.

This outline is developed from the Constitution of the United States. You will find articles on the various subjects in THE NEW PRACTICAL REFERENCE LIBRARY, but since every one has access to the Constitution it has not been thought advisable to give it space in the LIBRARY.

3. To insure domestic tranquillity.
4. To provide for the common defense.
5. To promote the general welfare.
6. To secure the blessings of liberty to the people.

House of Representatives

I. Members.
   1. Number—determined by Congress.
   2. Term of office—two years.
   3. Election—by the voters or electors.
      (What is the qualification of electors?)
   4. Qualifications.
      a. Age.
      b. Citizenship.
      c. Residence.
      d. Official disencumbrance.
   5. Apportionment.
      a. According to population by census.
      b. Conditional—may be reduced if the right to vote is abridged.
   6. Vacancies—filled by election.

II. House Powers.
   1. Elective.
      a. House officers.
      b. President of United States.
   2. Inquisitorial—originates impeachments.
   3. Legislative.
      a. Exclusive—has sole power of originating bills for raising revenue.
      b. Concurrent—coördinate with the Senate in general legislation.

Senate

I. Members.
   1. Number—two from each state.
   2. Term of office—six years.
   3. Election—by state legislature.
   4. Classes.
   5. Vacancies.
   6. Qualifications.
      a. Age.
      b. Citizenship.
      c. Residence.
      d. Loyalty.
      e. Official disencumbrance.
   7. Presiding officer—decides questions of order.
      a. Vice President of United States.

II. Senate Powers.
   1. Elective.
      a. Vice President.
      b. President pro tempore.
      c. Senate officers.
   2. Judicial.
      a. Number necessary to convict—two-thirds present.
      b. Judgment in impeachment.

3. Legislative.
4. Executive.
    a. In making appointments.
    b. In making treaties.

III. Elections.
1. Legislatures of states.
2. Congress may regulate except as to place of choosing.

IV. Meeting.
1. Frequency—at least once each year.
2. Time.
    a. By the constitution, first Monday in December.
    b. By law Congress may appoint a different day.
    c. President may call extra sessions.

Provisions Common to Both Houses

I. Membership.
1. Each house judges elections, returns, and qualifications of its own members.
2. Election must be legal, the returns valid and the person must be qualified.

II. Quorum.
1. Number—a majority of each house.

III. Business Rules.
1. Each house may determine its own rules.

IV. Penalties.
1. Punishment—for disorderly conduct.
2. Expulsion—by two-thirds vote.

V. Journal.
1. Kept by each house.
2. Publication.

VI. Yeas and Nays.
1. Entering.
2. Manner of taking.
3. Objects.

VII. Adjournment.

VIII. Salaries.
1. Amount.
2. How paid.

IX. Official Rights—Freedom.
1. From arrest.
2. Of speech.

X. Prohibitions on Members—To Prevent Corruption.

XI. Official Oath.

Powers of Congress

I. Express Powers.
1. To lay and collect taxes.
2. To borrow money on credit of United States.
3. To regulate commerce.
4. To establish a uniform rule of naturalization.
5. To establish uniform laws of bankruptcy.

6. To coin money and regulate the value.
7. To fix the standards of weights and measures.
8. To provide for punishment of counterfeiting.
9. To establich postoffices and post roads.
10. To grant patents and copyrights.
11. To establish inferior United States courts.
12. To have charge of matters related to war.
13. To exercise control over United States territory.

II. Implied and Incidental Powers.
1. To purchase foreign territory.
2. To establish military and naval academies.
3. To make internal improvements.
4. To create corporations.
5. To make all laws necessary to carry into effect all powers.

III. Powers Prohibited and Restricted.
1. To suspend the writ of habeas corpus.
2. To pass a bill of attainder.
3. To pass an ex post facto law.
4. To lay direct taxes unless in proportion to the census.
5. To lay taxes on state exports.
6. To give preference to the ports of one state over another.
7. To compel vessels to enter any port other than the one bound for.
8. To draw money from treasury without lawful appropriations being made.
9. To grant titles of nobility.
10. To abridge freedom of speech or of the press.
11. To establish religion or prohibit its exercise.
12. To deny the right of assembling to petition the government.
13. To repudiate debts.

Executive

I. Necessity and Object—To Execute the Laws.
II. Term of Office.
III. Election.
1. By electors.
2. By House of Representatives.

IV. Qualifications—Give a Reason for Each.
1. Birth.
2. Age.
3. Residence.

V. Vacancy in Office of President.
VI. Salary—Fixed by Congress.
1. Payment—monthly.
2. Amount.

VII. Oath of Office.
VIII. Powers and Duties.
1. Commander-in-chief of the army and navy.
2. Commander-in-chief of the militia when in actual service.
3. By and with the advice and consent of the Senate he may appoint many government officials.
4. Fill vacancies occurring during recess of Senate.
5. Grant reprieves and pardons except in cases of impeachment.

6. With the concurrence of the Senate make treaties.
7. Convene either or both houses of Congress if occasion so demands.
8. Recommend such measures to Congress as he shall judge expedient.
9. Receive ambassadors and public ministers.
10. Take care that the laws are faithfully executed.
11. Commission all officers of the United States.

IX. Removal from Office.

The Cabinet Officers

I. Appointed by President with Advice and Consent of Senate.
II. Salary.
III. Members.
1. Secretary of State.
a. Has charge of foreign and domestic relations.
2. Secretary of Treasury.
a. Collects and disburses public money.
3. Secretary of War.
a. Directs the army and military matters.
4. Secretary of Navy.
a. Controls the navy and naval affairs.
5. Secretary of Interior.
a. Manages public lands, education, indians, pensions and patents.
6. Postmaster-General.
a. Has charge of transmitting and distributing mail matter.
7. Attorney-General.
a. Has charge of the legal department.
8. Secretary of Agriculture.
a. Has charge of the agricultural reports and development.
9. Secretary of Commerce and Labor.
a. Has charge of corporations and manufactures, census bureau, immigration, etc.

Judicial Department

I. Objects—To Interpret and Apply the Laws.
II. In What Vested?
1. Supreme Court.
a. Members—Chief Justice and eight Associate Justices.
b. Session—where and when?
2. Inferior Courts—established by Congress.
a. Circuit courts—number?
b. District courts—number?
III. Judges.
1. How chosen?
2. Oath of office?
3. Term of office?
4. Number?
5. Salaries?
6. Removals?
7. Provisions for retirement?
IV. Officers.

V. JURISDICTION.
VI. TRIALS.
1. Civil cases.
2. Criminal cases.
VII. TREASON.

QUESTIONS ON CIVIL GOVERNMENT.

What state has been annexed? (Texas.)

What state had no territorial government before admission? (California.)

Define constitution. Law.

Is a constitution necessarily a written instrument?

Give a distinction between the two kinds of constitutions.

What is the greatest example of a constitution combining and limiting the various departments of government?

What is the object of government?

Name the most common kinds of government.

Where does the government get its power?

What is peculiar of our own form of government?

Name three kinds of colonial governments.

What is the supreme power in the British system of government?

Give an important distinction between the constitution of the United States and the constitution of the states of the Union.

What party was founded on the platform "The constitution of the country, the union of the states and the enforcement of the laws?"

Why did the colonies refuse to be taxed?

What did the first Continental Congress do?

What represented the central government during the Revolution?

Explain the defects in the Articles of Confederation that made the central government weak.

When was the constitution formed? When adopted?

Name the three departments of our government.

What was the Conway Cabal?

What were the Articles of Confederation?

In what is the law-making power vested?

How are representatives chosen?

How is the number of representatives determined? How chosen?

How are the members of the lower house of the state legislature chosen?

What are the qualifications of representatives?

Can a congressman hold any other civil office?

In what years is the census taken?

Are territories allowed representatives in Congress?

How are vacancies in the House filled?

Who is the present speaker in the House?

How are senators chosen? Number and term of office?

CIVIL GOVERNMENT.

NOTE.—Let every American, every lover of liberty, ever well-wisher to posterity, pledge his life, his property and his sacred honor to the support of the Constitution and the laws. —*Abraham Lincoln.*

"Without civic and political education the sovereign people is a child playing with fire, at the risk each moment of burning down the house." —*Pestalozzi.*

Who is president of the Senate? Can he vote? What are the other officers?

What judicial power has the Senate?

Who presides over the Senate when the President is impeached? Why?

What power has Congress concerning elections?

When are representatives elected?

When does Congress meet?

Who makes the final decision as to who are entitled to a seat in either house of Congress?

What constitutes a quorum?

Can absent members be compelled to attend?

What is the power of each house in regard to rules, order, etc.?

What is the rule of adjournment? What was the object of this rule?

Where do senators and representatives get their pay? How much?

Can congressmen be arrested? When? Can suit be brought against them for language used in debate? Why?

Can congressmen fill lucrative offices which have been created during the time for which they were elected?

Can a congressman hold any office under the United States at the same time he is a congressman?

Where do bills for revenue (levying taxes) originate?

Name the general powers of congress.

What prohibitions does the constitution place upon the states?

What are United States bonds?

Can Chinese become citizens of the United States? Why?

What is money? Who fixes the standard of weights and measures?

What is counterfeiting?

How are copyrights obtained? Patents?

Who establishes inferior courts of the United States?

What is piracy? What are letters of marque and reprisal?

What is the limit of appropriations for war?

Of what use is the navy?

What is the difference between the militia and the regular army?

What is an express power? Incidental or implied power?

Name four incidental powers of Congress.

What provisions were made by the constitution concerning slavery?

Define habeas corpus. When has the writ of habeas corpus been suspended? Why? Who has the power to suspend it?

What is a bill of attainder?

What is an ex post facto law?

How must direct taxes be apportioned by the general government?

Why should states be prohibited from forming treaties?

Can a state pass any law impairing the obligation of contracts?

In what is the executive power vested?

Describe the manner of electing the President. What must be his qualifications?

What is the presidential succession law of 1886?

What is the salary of the President?

What oath does the President take?

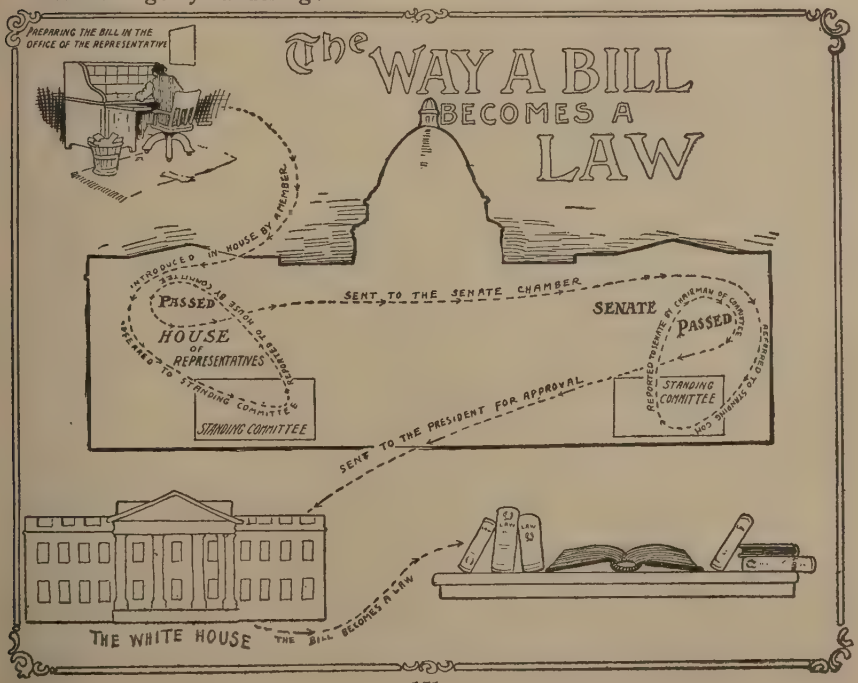
How can the President be removed from office?

How does the President make appointments?

What is meant by "civil service reform?"

What is the President's message?

In what is the judicial power vested?
What inferior United States courts have been established?
Of how many justices does the Supreme Court consist?
How many circuit judges are there?
Can district courts cross state lines?
What is meant by original and appellate jurisdiction?
Who are the citizens of the United States?
Can a person be tried twice for the same crime?
Can private property be taken for public use?
What is treason? What is necessary to convict?
What is the punishment for treason?
Name some of the rights of states.
What is extradition?
What was the "Ordinance of 1787?"
Can the United States acquire territory? How?
What is the relation of a territory to the Union?
Is a state compelled to remain a state?
How was Texas admitted?
What was the condition of the seceded states after the Civil War?
What question did the Civil War settle?
How may amendments be proposed? Ratified?
When does an amendment become valid?
What is the supreme law of the land?
Can a state nullify the laws of the Union?
How was the constitution ratified?
What state was the last one to ratify it?
How many amendments have been made to the constitution?
What is the nature of the first ten amendments?
How many states has the Union? Territories?
How did the United States get all its present territory?
What is gerrymandering?



ELECTORAL AND POPULAR VOTES OF 1908, COMPARED WITH THOSE OF 1904

State	Elec'l Vote 1908		Elec'l Vote 1904		Popular Vote, 1908											Popular Vote, 1904							
	Taft	Bryan	Roosevelt	Parker	Taft	Bryan	Chafin	Debs	Hisgen	Watson	Gilhaus	Turney	Republican Pluralities.	Democratic Pluralities.	*Total Vote.	Roosevelt	Parker	Swallow	Debs	Watson	Corregan	Holcomb	Total Vote.
Alabama	...	11	...	11	26,283	74,374	665	1,399	495	1,568	.....	...	.....	48,091	104,784	22,474	79,857	612	830	5,040	.....	...	108,822
Arkansas	...	9	...	9	56,624	87,015	1,194	5,842	289	1,026	.....	...	.....	30,391	151,990	46,860	64,434	993	1,816	2,318	.....	...	116,421
California	10	...	10	...	214,398	127,492	11,770	28,659	4,278	.....	.....	...	86,906	.....	386,597	205,226	89,404	7,380	29,535	.....	.....	...	331,871
Colorado	...	5	5	...	123,700	126,644	5,559	7,974	.....	.....	.....	...	.....	2,944	263,877	134,687	100,105	3,438	4,304	824	335	...	243,693
Connecticut	7	...	7	...	112,815	68,255	2,380	5,113	650	.....	.....	...	44,560	.....	189,903	111,089	72,909	1,506	4,543	494	575	...	191,127
Delaware	3	...	3	...	25,014	22,071	670	239	30	.....	.....	...	2,943	.....	48,024	23,705	19,347	607	146	51	.....	...	43,856
Florida	...	5	...	5	10,654	31,104	1,356	3,747	553	1,946	.....	...	.....	20,450	49,360	8,314	27,046	5	1,605	.....	.....	...	39,307
Georgia	...	13	...	13	41,603	72,048	1,058	584	77	16,910	.....	...	.....	30,445	132,280	24,003	83,472	685	197	22,635	.....	...	130,992
Idaho	3	...	3	...	50,091	34,609	1,740	6,305	207	.....	.....	...	15,482	.....	92,952	47,789	18,480	1,013	4,949	353	.....	...	72,584
Illinois	27	...	27	...	629,932	450,810	29,364	39,711	7,724	633	1,680	400	179,122	.....	1,160,254	632,645	327,606	34,770	69,225	6,725	4,698	830	1,076,499
Indiana	15	...	15	...	348,993	338,262	18,045	13,476	514	1,193	643	...	10,731	.....	721,126	368,289	274,345	23,496	12,013	2,444	1,598	...	682,185
Iowa	13	...	13	...	275,210	200,771	9,837	8,287	404	251	.....	...	74,439	.....	494,760	307,907	149,141	11,601	14,847	2,207	.....	...	485,703
Kansas	10	...	10	...	197,166	161,209	5,032	12,420	79	.....	.....	...	35,957	.....	375,974	210,893	84,800	7,244	15,494	6,156	.....	...	324,588
Kentucky	...	13	...	13	235,711	244,092	5,887	4,060	200	333	404	.....	.....	8,381	490,687	205,277	217,170	6,609	3,602	2,511	596	...	435,765
Louisiana	...	9	...	9	8,958	63,568	.....	2,538	73	.....	.....	...	.....	54,610	75,137	5,205	47,708	.....	995	.....	.....	...	53,905
Maine	6	...	6	...	66,987	35,405	1,487	1,758	700	.....	.....	...	31,582	.....	106,337	64,437	27,630	1,510	2,103	338	.....	...	96,027
Maryland	2	6	1	7	116,513	115,908	3,302	2,323	485	.....	.....	...	605	.....	238,531	109,497	109,416	3,034	2,247	.....	.....	...	224,224
Massachusetts	16	...	16	...	265,966	155,543	4,373	10,778	19,237	.....	1,011	...	110,423	.....	456,908	257,822	165,746	4,274	13,604	1,294	2,359	...	445,104
Michigan	14	...	14	...	335,580	175,771	16,974	11,586	760	.....	1,096	63	159,809	.....	541,830	361,866	134,151	13,308	8,941	1,159	8,941	...	520,437
Minnesota	11	...	11	...	195,786	109,433	10,114	14,469	523	.....	.....	...	86,353	.....	330,325	216,651	55,187	6,253	11,692	2,103	974	...	292,860
Mississippi	...	10	...	10	4,463	64,250	.....	1,048	.....	1,309	.....	...	.....	59,787	71,070	3,168	53,280	.....	392	1,424	.....	...	58,264
Missouri	18	...	18	...	347,203	346,574	4,222	15,398	397	1,165	867	...	629	.....	715,826	321,449	296,312	7,191	13,009	4,226	1,674	...	643,861
Montana	3	...	3	...	32,333	29,326	827	5,855	443	.....	.....	...	3,007	.....	68,781	34,932	21,773	335	5,676	1,520	208	...	64,444
Nebraska	...	8	8	...	126,608	130,781	5,179	3,524	.....	.....	.....	...	.....	4,173	266,092	138,558	51,876	6,323	7,412	20,518	.....	...	232,268
Nevada	...	3	3	...	10,214	10,655	.....	2,029	415	.....	.....	...	.....	441	23,313	6,867	3,982	.....	925	344	.....	...	12,118
New Hampshire	4	...	4	...	53,144	33,655	905	1,299	584	.....	.....	...	19,489	.....	89,587	54,164	34,075	750	1,090	83	.....	...	90,162
New Jersey	12	...	12	...	265,298	182,522	4,930	10,249	2,916	.....	1,196	...	82,776	.....	467,111	245,138	164,550	6,838	9,582	3,704	2,676	...	432,488
New York	39	...	39	...	870,070	667,468	22,667	38,451	35,817	.....	3,877	...	202,602	.....	1,638,350	859,444	683,822	20,776	36,883	7,459	9,125	...	1,617,509
North Carolina	...	12	...	12	114,937	136,995	.....	345	.....	.....	.....	...	.....	22,058	252,277	82,442	124,121	361	124	819	.....	...	207,867
North Dakota	4	...	4	...	57,771	32,909	1,453	2,465	38	.....	.....	...	24,862	.....	94,636	52,595	14,273	1,140	2,017	165	.....	...	70,190
Ohio	23	...	23	...	572,312	502,721	11,402	33,795	433	158	720	...	69,591	.....	1,121,541	600,095	344,674	19,339	36,260	1,392	2,633	...	1,026,229
Oklahoma	...	7	...	7	110,558	122,406	.....	21,779	274	436	.....	...	.....	11,848	255,453	.....	.....	.....	.....	.....	.....	...	.....
Oregon	4	...	4	...	62,350	38,049	2,682	7,430	289	.....	.....	...	24,301	.....	110,800	60,455	17,521	3,806	7,619	753	.....	...	90,154
Pennsylvania	34	...	34	...	745,779	448,785	36,694	39,913	1,057	.....	1,222	...	296,994	.....	1,273,450	840,949	337,998	33,717	21,863	.....	2,211	...	1,236,738
Rhode Island	4	...	4	...	43,942	24,706	1,016	1,365	1,005	.....	183	...	19,236	.....	72,217	41,605	24,839	768	956	.....	488	...	68,656
South Carolina	...	9	...	9	3,847	62,289	.....	101	43	.....	.....	...	.....	58,442	66,280	2,554	52,563	.....	22	1	.....	...	55,140
South Dakota	4	...	4	...	67,466	40,226	4,039	2,846	88	.....	.....	...	27,240	.....	114,665	72,083	21,969	2,965	3,138	1,240	.....	...	101,395
Tennessee	...	12	...	12	118,287	135,630	360	1,878	332	1,081	.....	...	.....	17,343	257,568	105,369	131,653	1,889	1,354	2,491	.....	...	242,756
Texas	...	18	...	18	65,666	217,302	1,634	7,870	115	994	176	...	.....	151,636	293,757	50,307	167,200	3,865	2,787	8,062	421	...	232,642
Utah	3	...	3	...	61,028	42,601	.....	4,895	87	.....	.....	...	18,427	.....	108,611	62,444	33,413	.....	5,767	.....	.....	...	101,624
Vermont	4	...	4	...	39,552	11,496	799	802	804	.....	.....	...	28,056	.....	53,453	40,459	9,777	792	859	.....	.....	...	51,888
Virginia	...	12	...	12	52,573	82,946	1,111	255	51	105	25	.....	.....	30,373	137,066	46,450	80,638	1,382	56	359	218	...	129,103
Washington	5	...	5	...	106,062	58,383	478	14,177	248	.....	.....	...	47,679	.....	179,348	101,540	28,098	3,229	10,023	669	1,377	...	145,151
West Virginia	7	...	7	...	137,869	111,418	5,107	3,676	46	.....	.....	...	26,451	.....	258,116	132,608	100,850	4,413	1,572	99	.....	...	239,542
Wisconsin	13	...	13	...	247,747	166,632	11,572	28,170	.....	.....	314	...	81,115	.....	454,435	279,870	124,036	9,770	28,220	530	223	...	442,649
Wyoming	3	...	3	...	20,846	14,918	64	1,715	61	.....	.....	...	5,928	.....	37,604	20,489	8,930	217	1,077	.....	.....	...	30,715
Total	321	162	336	140	7,675,909	6,410,027	247,948	432,598	82,821	29,108	13,414	463	1,817,295	551,413	14,893,046	7,620,670	5,080,207	258,205	401,380	112,510	41,330	830	13,539,523
Plurality	159	...	196	...	1,265,882	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	2,540,463	.....	.....	.....	.....	.....	.....	...	.....
Majority	...	...	...	...	459,530	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	1,726,208	.....	.....	.....	.....	.....	.....	...	.....
Percent. of total vote	...	...	...	...	51.54	43.04	.....	.....	.....	.....	.....	...	.....	.....	.....	56.28	37.52	.....	.....	.....	.....	...	.....

* Includes scattering votes in a few cases [m].

Election of 1908

Our page of tabulated matter gives you the electoral and popular vote by states for each presidential candidate and enables you to make the comparison of the vote at the last election with that of four years ago. One can readily see the change in votes by states and for the various parties.

The total popular vote increased in four years 1,353,523. The only addition to the electoral vote was the seven gained by the admission of Oklahoma as a state. While Pennsylvania, New York and Illinois lead in the size of their Republican pluralities, it is also interesting to note that these states and Ohio give to the Democratic candidate his greatest popular vote.

This table will not only prove valuable for reference but will also acquaint one with the results of our important function of citizenship.

REPUBLICAN CANDIDATES.

WILLIAM HOWARD TAFT.

BIRTH: Sept. 15, 1857, Cincinnati.
PARENTS: Alphonso and Louise M. Taft.
EDUCATION:
1878 Graduated from Yale.
1880 LL. B. Cincinnati Col. of Law.
1902 LL. D. University of Pa.
1903 LL. D. Yale.
1905 LL. D. Harvard.
1905 LL. D. Miami.
MARRIAGE: 1886, Miss Helen Herron.
FAMILY: Two sons and one daughter.
PROFESSION: Law.
CAREER:
1880 Admitted to Bar.
1882-3 Collector Internal Revenue.
1887-90 Judge of Superior Court.
1890-2 Solicitor General of U. S.
1892 U. S. Circuit Judge.
1901-4 Governor-General Philippines.
1904-8 Secretary of War.
1908 Elected President of the U. S.
HOME: Cincinnati, Ohio.

JAMES S. SHERMAN.

BIRTH: Oct. 24, 1855, at Utica, N. Y.
PARENTS: Gen. Richard and Mary F. Sherman.
EDUCATION:
1878 Graduated from Hamilton College.
1903 LL. D. Hamilton College.
MARRIAGE: 1881, Miss Carrie Babcock.
FAMILY: Three sons.
PROFESSION: Law.
CAREER:
1880 Admitted to Bar.
1884 Mayor of Utica.
1887 Member of Congress.
1908 Elected Vice-President of U. S.
HOME: Utica, N. Y.

DEMOCRATIC CANDIDATES.

WILLIAM J. BRYAN.

BIRTH: Salem, Ill., March 19, 1860.
PARENTS: Silas L. and Mariah E. Bryan.
EDUCATION:
1881 Graduate of Illinois College.
1883 LL. B. Union College of Law.
1884 A. M. Illinois College.
MARRIAGE: 1884, Mary E. Baird.
FAMILY: Two daughters and one son.
PROFESSION: Law.
CAREER:
1883 Admitted to Bar.
1883-7 Practiced Law at Jacksonville.
1887 Removed to Lincoln, Neb.
1891-5 Member of Congress.
1896, 1900, 1908 Presidential Nominee.
1906 Tour of the world with family.
WRITINGS:
1897 The First Battle.
1901 Began publication of Commoner.
1904 Under Other Flags.
HOME: Lincoln, Neb.

JOHN WORTH KERN.

BIRTH: Dec. 20, 1849, Howard Co., Ind.
PARENTS: Jacob H. and Nancy L. Kern.
EDUCATION: 1869, Graduate of University of Michigan.
PROFESSION: Law.
MARRIAGE: 1870, Miss Anne Hazzard.
1895, Araminta Cooper.
FAMILY: Two sons and one daughter.
CAREER:
1872 City Attorney of Kokomo.
1892-6 Indiana State Senator.
1897-01 City Attorney of Indianapolis.
1900-04 Candidate for Governor of Indiana.
1908 Vice-Presidential Nominee.
HOME: Indianapolis.

PROHIBITION CANDIDATES.

E. W. CHAFIN.

BIRTH: 1852, East Troy, Wis.
PARENTS: Samuel and Betsy Chafin.
EDUCATION: Graduate Law Department, University of Wisconsin.
PROFESSION: Lawyer.
MARRIAGE: Carrie A. Hankins.
CAREER:
1876-1900 Lawyer at Waukesha, Wis.
1882-1902 Candidate for Congress.
1886-1900 Candidate for Attorney-General.
1898 Candidate for Governor of Wisconsin.
1908 Presidential Nominee.
WRITINGS:
1876 Voters' Handbook.
1896 Lives of the Presidents.
HOME: Chicago.

A. S. WATKINS.

BIRTH: 1863, Logan County, Ohio.
PARENTS: Quakers.
EDUCATION: Ohio Northern University. Taylor University.
PROFESSION: Minister, Lawyer, Teacher.
CAREER:
1905 Candidate for Governor of Ohio. Professor Literature Ohio Northern University.
1908 Vice-Presidential Candidate.
HOME: Ada, Ohio.

SOCIALIST CANDIDATES.

EUGENE V. DEBS.

BIRTH: 1855, Terre Haute, Ind.
PARENTS: Daniel and Marguerite Debs.
EDUCATION: Secured in Common Schools.
PROFESSION: Workingman, Writer, Lecturer and Orator.
MARRIAGE: Katherine Metzel.
CAREER:
1871-4 Locomotive Fireman.
1879-83 City Clerk of Terre Haute.
1885 Member of Indiana Legislature.
1886-93 Grand Secretary and Treasurer Brotherhood of Locomotive Firemen.
1893-97 President American Railway Union.
1900, 4, 8 Presidential Nominee, Socialist Party.
HOME: Terre Haute, Ind.

BENJAMIN HANFORD.

HOME: New York.
Member of Typographical Union twenty-eight years.
Socialist Orator.

POPULIST CANDIDATES.

THOMAS E. WATSON.

BIRTH: 1856, Columbia County, Ga.
PARENTS: John and Ann Watson.
EDUCATION: Two years in Mercer College.
PROFESSION: Lawyer, Author, Editor.
CAREER:
1875 Admitted to Bar.
1882-3 Member of Georgia Legislature.
1891-3 Member of Congress.
1896 Populist Vice-Presidential Nominee.
1904-8 Nominee for President.
WRITINGS:
1898 Story of France.
1900 Life of Thomas Jefferson.
1902 Life of Napoleon.
HOME: Thomso Ga.

SAMUEL WILLIAMS.

BIRTH: 1846.
PROFESSION: Law.
CAREER: Member of Legislature of Indiana.

INDEPENDENCE CANDIDATES.

THOMAS L. HISGEN.

BIRTH: 1858, Petersburg, Ind.
EDUCATION: Secured in Common Schools.
PROFESSION: Business Man.

JOHN TEMPLE GRAVES.

BIRTH: 1856, Willington Church, S. C.
PARENTS: Joseph P. and Katherine Graves.
EDUCATION: Graduate University of Georgia.

CAREER:
Clerk in Country Store.
Oil Merchant at Albany, N. Y.
1907 Independence Candidate for Governor of Massachusetts.
HOME: Springfield, Mass.

PROFESSION: Journalist and Orator.
MARRIAGE: Mattie E. Simpson.
CAREER:
1881-90 Editor.
1905-07 Editor Atlanta Daily Georgian.
1907 Editor New York American.
HOME: New York City.

Platforms

REPUBLICAN PLATFORM.

1. Tariff revision on basis of protection.
2. Investigation of currency question by commission and development of adequate currency system.
3. Establishment of postal savings banks.
4. Strengthening of Sherman Anti-Trust Law by amendment for curbing of trusts.
5. Strict enforcement of laws prohibiting rebating and railroad rate discrimination.
6. Employers' liability law; further legislation to improve conditions of laboring men.
7. Integrity of courts; modification of rules governing issuing of injunctions.
8. Extension of rural free delivery.
9. Enforcement of 13th, 14th and 15th amendments for the protection of the negro.
10. Conservation of natural resources.
11. Maintaining efficiency in army and navy.
12. Liberal pensions to veterans.

DEMOCRATIC PLATFORM.

1. Curtailment in national expenditures.
2. Revision of rules of House of Representatives, limiting power of speaker.
3. Immediate and thorough revision of tariff to stop special privileges and give equality of opportunity to all.
4. Immediate admission of Arizona and New Mexico as states.
5. Modification of law governing injunctions.
6. Alaska and Porto Rico to be made territories.
7. Enlargement of powers of interstate commerce commission.
8. Strict enforcement of railroad rate and anti-trust laws.
9. Maintenance of an adequate army and navy.
10. Election of U. S. Senators by direct vote.
11. Publication of campaign contributions before elections.
12. Income tax and guarantee of bank deposits.

PROHIBITION PLATFORM.

1. Prohibition of manufacture and sale of liquor by constitutional amendment. Immediate prohibition of liquor traffic for beverage purposes in the District of Columbia, the territories and all places over which the national government has jurisdiction.
2. Election of U. S. senators by direct vote.
3. Postal savings banks and guarantee of bank deposits.
4. Uniform marriage and divorce laws; employers' liability law.
5. Prohibition of child labor in factories, etc.
6. Basing of suffrage only on intelligence and the ability to read and write the English language.

SOCIALIST PLATFORM.

1. Collective ownership of all land and of all means of transportation and communication.
2. Abolition of the United States Senate.
3. Election of all judges for short terms.
4. Inheritance and income tax.
5. Initiative, referendum and right of recall.
6. Universal suffrage.

POPULIST PLATFORM.

1. Power to issue money to belong to the government alone.
2. Government ownership of railroads and public utilities.
3. Initiative and referendum.
4. Abolition of child and convict labor.
5. Giving workmen work on public buildings in times of depression.

INDEPENDENCE PARTY PLATFORM.

1. Restoration of government to principles of Washington and Jefferson.
2. Direct nominations; initiative and referendum; right of recall.
3. Opposition to arbitrary use of injunctions; trial by jury in all contempt cases.
4. Rigid employers' liability and child labor laws. Extension of eight-hour work day to all government work.
5. Gradual reduction of the tariff; establishment of postal savings banks.
6. Criminal punishment for violators of anti-trust laws; extension of principle of public ownership to all utilities.

The best work a student does is that
which teaches him the love of work and study.
—*Bishop Spalding.*

Common Subjects

We feel that our EDUCATOR would not be complete unless mention was made of what, from lack of a more suggestive name, we term "COMMON SUBJECTS." The work along this line in THE NEW PRACTICAL REFERENCE LIBRARY is indeed complete and interesting. From the primary up through the different grades the teacher and student is face to face with a thousand and one articles both at home and in school the elements and preparation of which he is in all but absolute ignorance; especially is this true of the processes of manufacture, sources of material, etc.

Take, for instance, the new and oftentimes startling uses to which the by-products of an industry are put: the making of buttons from blood, the conversion of rags, straw, etc., into paper, the manufacture of glass, celluloid, combs, needles, pins, etc.; the utilizing of the bones, hair, hoofs, etc., of animals into everyday articles, the use of which is perfectly familiar to the student, though of the source or methods of manufacture he has not the remotest idea. It gives us a sense of satisfaction to know that the teacher, student or general reader whenever occasion arises may consult THE NEW PRACTICAL REFERENCE LIBRARY on the subject in mind and invariably find a complete and interesting treatment of same.

We cite you to our outlines below in which a number of these subjects are treated, indicating the manner of handling others.

Meat Packing

U. S. GOVERNMENT INSPECTION.
- Requirements.
- How enforced.
- When effective.
- Results.

REFRIGERATION.
- Railroads.
- Steamships.

CENTERS.
- Name four.
  1.
  2.
  3.
  4.

BY-PRODUCTS.
- Horns.
- Hoofs.
- Combs.
- Buttons.
- Knife handles.
- Glue.
- Soap.
- Oils.
- Hair.
- Wool.
- Bristles.
- Hides.
- Blood, etc.

PROCESSES.
- Transporting stock.
- Unloading.
- Killing.
- Dressing.
- Cooling.

PRODUCTS.
- Fresh meats.
- Salt meats.
- Smoked meats.
- Lard.
- Tallow.
- Canned beef.
- Sausage, etc.

QUESTIONS.

How many hogs are slaughtered every minute in the Chicago packing houses?

Are cattle given any rest after reaching the stockyards before being slaughtered?

How long does it take to cool pork in the cooling room? Beeves? What is the temperature?

What is done to make the meat more tender?

What are the leading packing centers of the country?

Of what does the late government meat inspection consist?

What is an abattoir?

How many minutes does it require to kill and dress a hog? A steer?

How is fresh meat shipped from Chicago or other packing centers to European cities?

What is the value of hogs' bristles exported each year?

How many million cattle are slaughtered in the United States every year? How many sheep? Hogs?

Paper

History.	Manufacturing Materials.	Uses.
Origin.		Name five.
China.	Vegetable fiber.	1.
First use.	Silk.	2.
Europe.	Wool.	3.
England.	Linen rags.	4.
United States.	Cotton rags.	5.
	Wood pulp.	Kinds.
	Wheat straw.	Linen.
	Corn husks.	Manila.
	Hemp ropes.	Japanese.
		Indian.

QUESTIONS.

From what does paper take its name? Why?

To whom is credit given for the discovery of paper-making?

How many centuries before Christ was the art known?

Name three of the most important and valuable uses to which paper is put. Why your answer?

When and where was the first paper mill in the United States started? How does the United States now rank in its manufacture?

From what is the paper of the newspapers made? The paper of your writing tablet?

Describe in detail how rags are made into paper. What does the pulp resemble?

Describe the various sections and functions of a modern paper-making machine.

How is the water-mark made?

What is the best quality of paper? For what is it largely used? What paper is hand-made?

Glass

I. KINDS.
- Plate.
- Flint.
- Crown.
- Cut.
- Colored.
  - See color plate.
- Stained.

II. HISTORY.
- Egypt.
- Greece.
- England.
- United States.

III. MANUFACTURE AND INGREDIENTS.
- Fuel.
- Furnace.
  - Shape.
  - Capacity
  - Pots.
- Sand.
- Soda.
- Lime.
- Potash.

IV. SHAPING.
- Blowing.
  - Bottles.
  - Vases.
  - Window glass.
- Pressing.
  - Tableware.
- Casting.
  - Plate glass.

V. COLOR PLATE.

QUESTIONS.

What is glass? When was the discovery made?

In what country were specimens of glass discovered made as early as 2000 B. C.?

Did the ancient Greeks know the art of artistic glass-making?

How is window glass made? How cut? How flattened?

How are bottles made? Glass fruit jars?

How is cut glass made? What makes it so expensive?

How is stained glass made?

When and where was glass first used for windows?

What fuel is used in the furnace in making glass?

Why should the raw materials be pure?

How is coloring in glass introduced?

When was the manufacture of glass first introduced in the United States?

What are the leading countries in the manufacture of glass?

What tools does a glass-blower use?

To what is due the softness and brilliancy of plate glass?

Why are glass factories most numerous in the gas belts of the country?

How many pounds of melted glass does the blower gather at the end of his pipe? How does he make it long?

How is lettering placed on bottles?

Camphor

I. DESCRIPTION.
1. What is camphor?
2. What tree produces it?
3. Product of what countries?
4. Prepared chiefly in what island?
5. What is the height of the Borneo camphor tree?
6. What other plants yield it?

II. USES.
1. As a stimulant.
   a. Internal.
   b. External
2. As a poison.
3. As a preservative.

Banana

I. Stem.
   1. What is the height of the plant?
   2. How is the stem formed?

II. Leaves.
   1. How many feet long are the leaves? How many wide? Used for what?
   2. Ribs.
   3. Veins.

III. Flowers.
   1. How long do the spikes of the flowers grow?
   2. Do the flowers blossom with their faces toward the ground or upward?

IV. Fruit.
   1. Which way does the fruit turn?
   2. How many pounds does a bunch of bananas weigh?
   3. What countries ship enormous quantities of the fruit to the United States?
   4. How is a bunch of bananas hung in the fruit store?

Brick

I. Manufacture.
   1. Material used.
   2. Process of making.
   3. Brick-making of early times.

II. Varieties.
   1. Pressed brick.
   2. Fire brick.
   3. Pavement brick or vitrified brick.
   4. Hollow tiles.

III. Size of Brick.
   1. Length.
   2. Width.
   3. Thickness.

IV. Uses of Brick.
   1. Buildings.
   2. Foundations.
   3. Sewers.
   4. Cisterns.
   5. Pavements, etc.

Correlated Subjects: Brick-Laying; Clay; Tile.

QUESTIONS.

How many kinds are found in your neighborhood? Name them.
Of what is brick made? In what way are bricks dried?
In what ancient countries have sun-dried bricks been found?
Why are some of these bricks of great historic value?
By whom was the art of brick-making introduced into England?
What kind of clay should be selected for the making of brick? What proportion of sand should it contain? Why is this necessary? How are bricks cut?
Why are some bricks re-pressed?
How many bricks will a good machine make in a day?
Describe a brick-kiln. What is meant by "firing?" How many days does this require?
Where are brickyards found?
Where are the greatest centers of the brick industry in the United States?
How many bricks does our country produce a year?
What is the value of this product?
Which variety of brick outnumbers all other styles?
What is pressed brick? Why is fire brick so called?

Why does pavement brick contain lime? Why is it sometimes called vitrified brick?

Why are bricks extensively used for building? For what other purposes are they used?

How are hollow tiles used?

Dress

I. Definition.
  1. General meaning.
  2. Special meaning.

II. Ancient.
  1. Egypt.
    a. Style.
    b. Articles.
    c. Materials.
  2. Assyria.
    a. Style.
    b. Materials.
    c. Trimmings.
  3. Greeks.
    a. Style.
    b. Articles.
      Chiton.
      Peplos.

III. Eastern Nations.
  1. Chinese.
    a. Any change from ancient?
    b. Dress accords with what?
    c. Laborers dress how?
    d. People of rank dress how?
    e. Garments. Men? Women?
  2. Japan.
    a. Style.
    b. Garments worn.
    c. European dress.
  3. India.
    a. Style.
    b. Materials.

IV. European Nations.
  1. Middle Ages.
    a. Men.
      Cloaks.
      Other articles.
      Armor. Why?
    b. Women.
      Articles.
      Style.
  2. Close of Middle Ages.
    a. What radical changes in style?
    b. Men.
      Garments cut how? How many? What materials?
    c. Women.
      Garments, styles, etc.
  3. Sixteenth to Eighteenth Centuries.
    a. Excessive extravagance.
      Leaders of fashion.
      How extravagant?
  4. Nineteenth to Twentieth Century.
    a. Modern fashions.
      Follow style of what age?
      What articles worn?
      Fashions governed by whom?
      How vary from year to year?

V. Barbarous Nations.
  1. American Indian.
  2. Eskimo.
  3. Negro tribes of Africa.

QUESTIONS.

Judging from colored plates, what would be your objection to ancient apparel? In what ways does it recommend itself?

In what ways is the modern dress of men superior to the ancient?

Were the men of ancient times handicapped by such apparel? Give reason for your answer.

Did the garment in ancient days depend in any way upon the work performed? Does it in modern times?

What is the costume known as the Louis XIV style? Did men and women in the United States ever follow this style? If so, when and where?

What is the dress of the American Indian? Eskimo? Highland Scot?

Tell what the following are and when worn and by what sex, what nation: Chiton, himation, peplos, toga, tunic, doublet, etc.

What quality of materials is worn by Chinese and Japanese of rank?

Who were the first people to fit the clothing?

What nations can be said to have worn classic styles?

Observing the colored plates, compare the styles of the German and English ladies of the seventeenth century. Which is the more substantial and serviceable?

Judging from the colored plates I and II, what is the chief difference in cut of garments of ancient and of modern times? Which is the simpler? Can each style be designated as extreme in character?

Athletics has a tendency to create what styles in dress?

What is known as the colonial style of dress in the United States?

The styles of United States as a general rule follow those of what country?

What purposes does dress serve?

What are the principal cities of fashion in United States? In Europe? What nation of Europe leads in styles of dress?

Cloths and Clothing

I. MATERIALS—RAW.
   1. Silk. 3. Cotton. 5. Flax. 7. Hides. 9. Feathers.
   2. Wool. 4. Fur. 6. Hemp. 8. Rubber. 10. Bone, Pearl, etc.

II. PREPARATION.
   1. Raw Articles.
      a. Where and how obtained.
      b. Rough processes for local markets.
   2. Manufacture.
      a. Methods—spinning, weaving, dyeing, tanning, etc.
      b. Placing product on world's markets.

III. FACTORIES.
   1. Location.
   2. Product.
      a. Cloths—All colors, weaves, qualities, quantities of silk, woolen, linen, cotton, etc.
      b. Clothing—Ready-made wearing apparel of fur, leather, cotton, silk and woolen goods, feathers, rubber, linen, bone, pearl, etc.

IV. MARKETS.
   1. Wholesale.
   2. Retail.

QUESTIONS.

Possibly that red button on your coat was made of blood; tell about it.
How can you tell linen towels from cotton ones?
What can you find in your home made of hemp? Flax? Hides?
Compare your fine new shoes with those worn a hundred years ago.
What do we mean by worsted goods? "All wool?" What is mixed goods?
Of what materials can lace be made?
What is celluloid? What have you in your home made of it?
Give different articles of clothing made of leather.
Which would you rather have, a silk or a calico dress? Why?
What do you think governs the price of cloth?
Why did a cotton famine occur in England during the Civil War?
How does ready-made clothing compare with that of twenty-five years ago in completeness?
Give a complete list of cloths used for wearing apparel in dress goods, underwear, etc. See how long you can make the list. Give the same of ready-made clothing.
What are velvet, plush, beaver, satin, etc.?
What determines the fineness of a piece of cloth?
Locate cotton and woolen mills throughout the world.
Can you trace the sap of the rubber tree until it comes to you in the shape of a pair of rubbers?
What do we mean when we say warp, filling, selvage, etc.?
You notice a beautiful plume in a milliner's window. Where did it come from?
Correlated Subjects: See different raw materials mentioned.

QUESTIONS.—Leather.

How are the skins of animals made into leather?
What is made from the skins of large animals such as the horse, ox, etc.?
How is tanning accomplished? How is the softening hastened? How is the hair removed?
What is done to prevent the formation of hard and brittle leather?
How long does it take to accomplish the tanning of large hides?
What skins are prepared by tanning?
From what is sole leather made? How is morocco leather made? Patent leather?
What country manufactures the best leather in the world?
The bark of what well-known tree is used in tanning?

Sugar

I. Sources.
  1. Sugar Cane.
    a. Where grown?
      Foreign.
      United States.
    b. Description.
      Height.
      Leaves.
      Resembles what plant?
    c. Sugar mills.
      Processes.
      Crushing stalks.
      Reduction of sap.
      Refining, etc.
    d. Products.
      Granulated sugar.
      Loaf sugar.
      Brown or raw sugar.
  2. Beets.
    a. Where grown?
      Foreign.
      United States.
    b. Sugar factories.
      Processes.
      Slicing beets.
      Drawing juice.
      Refining, etc.
  3. Maple Sap.
    a. Where produced?
    b. Season.
    c. Securing sap.
    d. Sugar-making (see sugar cane).
    e. Flavor, value, etc.
  4. Sorghum.
    a. Resembles what plant?
    b. Process (see sugar cane).
    c. Product.
      Syrup.
      Sugar—not of commercial importance.

II. Sugar Refineries.
  1. Location of.
  2. Work of refining.
  3. Annual output cane sugar, beet sugar.
  4. United States.
    a. Annual output of cane sugar.
    b. Annual output of beet sugar.
    c. Annual consumption of sugar.
    d. Annual importation of sugar.
    e. Annual consumption of individual.

III. By-Products.
  1. Molasses and Syrups.
    a. Sorghum.

b. New Orleans molasses.
c. Foundation for all syrups.
2. Bagasse. How used?
3. Beet Chips. How used?

IV. USES.
1. Food.
2. Medicine.

V. COMPARISON.
1. One ton cane produces?
2. One ton beets produces?
3. Four gallons maple sap produces?

QUESTIONS.—SUGAR.

How many pounds of sugar are made from a ton of beets? From a ton of West India cane? Louisiana cane?

How many pounds of sugar are used to each individual yearly in the United States?

What is the sugar you use daily made from—beets, sugar cane or maple sap?

How is loaf sugar made?

In what cities are some of the sugar refineries located in the United States? How many beet sugar factories are there? With what product do they work? What stage of the work do they handle?

How many thousands of tons of beet sugar are produced yearly in the United States?

What are the chief uses of maple sugar? What states in the Union lead in its production?

What is sorghum? Why is not the cane suitable for sugar?

What do we mean by raw sugar? What is "C" sugar? Brown sugar?

How is sugar regarded as a food? What is the effect upon the body?

What islands lead in the raising of sugar cane?

What states in the Union lead in the production of sugar?

What foreign countries lead in this enterprise?

How does the cane in the tropics compare with that of cooler climates?

What becomes of the crushed stalks?

Upon what does the growth of the sugar cane depend largely?

For how long a period does one planting last? Is this an important factor?

Why is maple sugar so highly prized?

What is done with the beets after extraction of the sugar? With the cane stalks?

What color is the raw sugar? What is used to whiten it?

Tell some of the domestic uses of sugar. What is candy made from?

What vegetables contain sugar? What grains? What liquids?

Think carefully of the different kinds of food and ascertain how many of them contain sugar in some form.

Salt

KINDS.

Rock, Salt Water, Brine Springs.

What is the great difference between salt and sugar other than in taste? In how many respects are they alike?

NOTE.—The great Austrian salt mine at Wieliczka has 600 miles of galleries and employs 9,000 miners. It has been worked for the past six centuries.

Where is salt extracted from sea water, principally produced?

By what process of drying is the purest variety produced?

What is salt made from sea water generally called?

From what source is the most salt produced?

Where in the United States would you find rock salt? Salt made from springs or wells?

In what inland state is found a lake whose waters yield fourteen pints of salt to every five gallons evaporated?

USES.

For seasoning.

For preserving.

For glazing pottery.

For hardening soaps, clearing glass, etc.

For what has salt been used since the earliest times?

What is it used for in manufacturing?

Of what chemicals is it the chief source?

SOURCES OF SUPPLY.

Foreign Countries.

United States.

a. Michigan. c. Utah. e. New York. g. Pennsylvania.
b. Kansas. d. Louisiana. f. Ohio. h. Illinois.

Where were salt mines worked extensively in the twelfth century and for what are they famous?

What is the leading salt-producing state in the Union?

What was the total production in the United States in 1902?

To what remarkable depth have the mines near Saginaw Bay, Michigan, been sunk?

Where is there an island of 144 acres of pure salt? How many tons is it estimated to contain?

With salt selling at two cents per pound what would be the value per acre of this island?

On what river's bank in Nevada is there a bluff of salt twenty-five miles long?

MISCELLANEOUS QUESTIONS.

Under the letter "A" in THE NEW PRACTICAL REFERENCE LIBRARY we have selected at random a few questions given below to which answers will be found by looking up subjects capitalized as *Aladdin, Alamo,* etc. Thousands upon thousands of similar questions will be found interestingly and satisfactorily answered throughout the LIBRARY and will furnish an endless chain of profitable study.

Who was the founder of the *Abolitionist* party? Who were some of its prominent leaders?

When did *Abruzzi* make his famous trip to the North Pole and what high latitude did he attain?

How is *Acetylene* gas produced? How does it differ from ordinary illuminating gas?

Who was *Achilles?* All but what small part of his body was invulnerable?

What is an *Acrostic* poem? In what style of verse has it been used?

What President of the United States was elected and served in Congress after the presidency?

For what is *Jane Addams* famous?

What is the proper form of *Address* in addressing the President? A governor? An archbishop?

Why is the *Adjutant* bird protected in India by law? Why its name?

What are the common *Adulterations* of food products? How is coffee adulterated? Bread? Milk? Tea? Pepper? Tobacco?

What enormous sum is expended every year for *Advertising* in the United States?

What is the story told in the *Æneid,* the great epic poem? By whom was it written?

Name five of the fables accredited to *Æsop.*

How does the area of *Africa* compare with that of North America? Of Asia? Europe?

How does the population of the British colonies in Africa compare with the population of the British Isles?

Who was *Louis Agassiz* and for what is he noted? For what is his son famous?

Where and when was the first *Agricultural* college established? What allusion was made to such a college by Washington in his first message?

What studies are included in the course of study and what experiments are made?

What is strange and peculiar about the *Aino* people?

How many parts of *Air* is oxygen? Nitrogen?

Describe the *Air* brake. By what means does it work automatically?

Describe the principles of the *Air Pump.* What happens to a lighted candle placed under the receiver as the air is exhausted? To a bell? An apple? What does this prove? Who invented the air pump?

What is the popular name of *Alabama?* In size how does it compare with your state?

What was the enormous loss inflicted on the Federal merchant fleet and how many vessels were captured by the *"Alabama?"*

What was *Aladdin's* lamp? Give a brief description of its many mystic wonders.

Why is the *Alamo* called the "Thermopylæ of America?"

For what remarkable length of time was the Alamo successfully defended and by how many?

How does the length of *Alaska* from north to south compare with the distance from Washington to New Orleans?

What is the size of Alaska? How does that compare with Texas and California combined?

When and from whom was Alaska purchased by the United States and at what price?

Which is the more valuable, the production of gold or the fisheries of Alaska?

Give five reasons why the purchase of Alaska was a bargain to the United States.

What was Alaska's population in 1900? Of these how many were whites? If the territory were cut up into equal parts how many sections would fall to the lot of each man, woman and child?

Which has the larger population, Nome, Alaska, or Trenton, N. J.?

What building in *Albany,* N. Y., cost over $24,000,000? For what is it noted?

What is an *Albino?* What causes the lack of color?

Why is *Alcohol* used in thermometers for recording very low temperatures? What is wood alcohol?

What was *Louisa May Alcott's* most famous book?

For what was *Alexander the Great* famous?

What makes *Alfalfa* especially valuable in times of drought? How many tons are raised per acre?

What qualities of greatness distinguished *Alfred the Great* from the many monarchs to whom the title "Great" has been given?

What is the science of *Algebra?* To what remote period does it date?

How many *Algonquin* Indians remain in Canada and the United States?

What were the *Alien* and *Sedition* laws?

When and where were *Almanacs* first used? For what were they so long popular? What was the most famous American almanac? English?

What are some of *Alma-Tadema's* well-known paintings?

What is the oldest of all *Alphabets?* From what is the English alphabet derived?

What is the general form of the *Alps?* For what are they noted? What are the two highest peaks? How are the glaciers formed?

What two animals are common to the Alpine region? Why?

What is *Aluminum?* When was it discovered? What are its principal qualities and uses?

How does the *Amazon* River compare in size with the Mississippi? What causes the water to raise thirty feet in the mouth of the river at a certain time each month?

What are the duties of an *Ambassador?* When are ambassadors ordinary? Extraordinary? Plenipotentiaries?

What is *Ammonia?* Name some of its uses?

What is the height of some of the peaks of the *Andes?*

The *Angel* fish is very ugly and voracious; then why so named?

What is an *Anesthetic?* What are some of the common forms in which administered?

What are some of the artificial baits used in *Angling* and from what and how made?

How have we come to have a knowledge of *Animal Intelligence?* Is the vision, hearing, memory, smell and taste of animals greatly developed? Give examples of each.

How does nature protect certain kinds of *Antelopes?*

Where is *Antioch* located? When did it have a population larger than that of Cincinnati?

What is an *Antiseptic?* Name several in common use.

How does the brain of the *Ape* compare in size to man's?

What are the symptoms of *Appendicitis?* When is death from this disease almost certain?

What is an *Aqueduct?* What is the size of the Croton aqueduct and where located?

What is the story of the *Arabian Nights?*

Where is *Ararat* Mount and how is it linked with Noah's ark?

What is *Arbitration?* What is a recent notable example?

When was *Armor Plate* first used on war vessels?

Who was *Benedict Arnold?* How did he die?

Describe the formation of *Artesian* wells.

From what and how are *Artificial* limbs made?

What is *Asbestos?* Where is it obtained? For what is it useful? What workmen wear mittens made from it and why?

Give some of the qualities of asbestos. Where is it obtained? For what is it most commonly used?

How is *Association Football* played? How does it differ from the Rugby style of playing?

By what means can you ascertain if you are affected with *Astigmatism?*

What animal furnishes the *Astrakan fur?*

What is an *Attachment* in law? An *Attainder?*

The *Audubon Society* is doing what creditable work?

What causes the *Aurora Borealis* or northern lights?

Who is *Alfred Austin?*

What is an *Avalanche?* Where did one fall containing a quarter of a million tons of snow?

Where are the *Azores?* To what country do they belong?

QUESTIONS.—Life-Saving Service.

What is the life-saving system?

When was it established in the United States?

How many life-saving stations in the country?

Of how many persons is a crew made up?

What is the head of the crew called?

When the waves are too high to use a life-saving boat, how are rescues made?

How and by what means are lives saved from vessels out of reach of the lifeboats?

Besides the saving of lives what constitute some of the important duties of the life-saving crew?

What is a buoy? A life-saving gun? A rocket?

CURRENT EVENTS.

Should both the President and Vice President suddenly die or become disabled from holding office, who would succeed to the presidency?

How many lives were lost in the Kingston disaster of 1907?

How many people are employed by the postmaster-general?

What is the average number of people to each postoffice in the country? Why are there fewer postoffices today than in 1900?

Who is the speaker of the House of Representatives?

Who is the present Secretary of State? Of War? Of Agriculture? Who is Chief Justice of the Supreme Court? How many chief justices since Washington's administration?

What two bodies of water will the Panama Canal connect? What will be its length? What is its width? Depth?

What is reciprocity? Why do manufacturers of certain products oppose reciprocity treaties? Cite a recent example.

How is free trade considered by most economists? What advantages would free trade bring you? What disadvantages?

If you sent goods to London or Paris would you be required to pay any custom duties on same to our government? If you purchased goods in either of the two cities or any other foreign city, would you be required to pay duty on them, and to whom?

What relation are Emperor William and King Edward?

Where is the Williamsburg Bridge? What is its length? How does it compare with the Brooklyn Bridge?

What industry would you find along the Columbia River?

Who is at the government head of the Philippine Islands? Is he elected or appointed, and by whom?

Of what are the native houses of the Philippine Islands made? (Observe the illustration.)

What is the Duma? How does it correspond to our lower house of congress?

When did Oklahoma become a state? What is its popular name?

Who is the present king of Spain? How old is he?

What two points will the Cape-to-Cairo Railway connect, and what will be its length?

From your location what would be the shortest and quickest route to Manila? Would this have been so before the completion of the Suez Canal?

Were you to visit Newfoundland what would you find the people chiefly interested in? The people of Cuba? Of Alaska? Of Hawaii?

What are some of Bryan's principles of government reform?

What would be the several modes of transportation you could avail yourself of in going from place to place in New York city? In London? In Venice?

What are the different motive powers in automobiles? Which so far has proven the most satisfactory? Why?

Were you to seek a clerkship in any of the government departments, in what subjects would you have to pass an examination? What per cent of proficiency would you have to show to become eligible to appointment?

Who is Nicola Tesla, and for what is he world-famous?

What is the Associated Press? How many newspapers are printed and folded per hour by some of the large printing presses?

How many newspapers are there in the United States?

How many Philadelphias would London make?

Overburden not thy memory to make so faithful a servant a slave. Remember Atlas was weary. Have as much reason as a camel, to rise when thou hast thy full load. Memory, like a purse, if it be overfull that it cannot shut, all will drop out of it; take heed of a gluttonous curiosity to feed on many things, lest the greediness of the appetite of thy memory spoil the digestion thereof. —*Thomas Fuller.*

"When all that is worldly turns to dross around us, books only retain their steady value."

—*Washington Irving.*

Drawing

We not only supply you with a series of progressive lessons in drawing, as represented in the following pages, but under Civil Government, Geography, History and Arithmetic we have especially emphasized the graphic features of these subjects. We especially call your attention to the great variety of lettering, of scrolls and of arrangement, all of which will add to the interest and educational value of these sketches.

The several pages of simple drawings lead up to the more difficult illustrations and supply material for any grade of work. In the first few lessons we simply represent the forms of the objects and in the more advanced work we supply the shading. The idea of nearness or distance is given by the aid of perspective, foreshortening and gradation. Two pages are given to this special feature, and a developed exercise shown which can be easily reproduced on the blackboard if the directions given are followed.

Work of this kind is beneficial to the student from a practical standpoint, since it enters into so many features of everyday life and is the basic knowledge for various occupations. It is a subject that especially appeals to the æsthetic nature of the individual, and its value from an artistic standpoint can hardly be estimated. The fact that this subject has recently become an emphasized feature of the more progressive schools is evidence of the educational value of such work.

While few finished artists may be developed as a result of this teaching, the training afforded should be such as to develop hand, head and heart in the expression and appreciation of the ideal, and thus, rather than be of special benefit only to the artistic few, be for the general good of all

OBJECTS.

To supply a means of expression.
To acquaint with the type forms of nature.
To cultivate the powers of observation.
To develop æsthetic judgment, care, neatness and accuracy.

PRELIMINARIES.

Have a plan for the work of each day, and work your plan.
Work should be varied by memory and blackboard drawing.
Sketch free hand, using a rule only to test the work.
Always hold the pencil at right angles to the line.
Sit erect and drill on the movement of hand and arm.

DEFINITIONS.

FORM. Shape represented by the outline of any object.

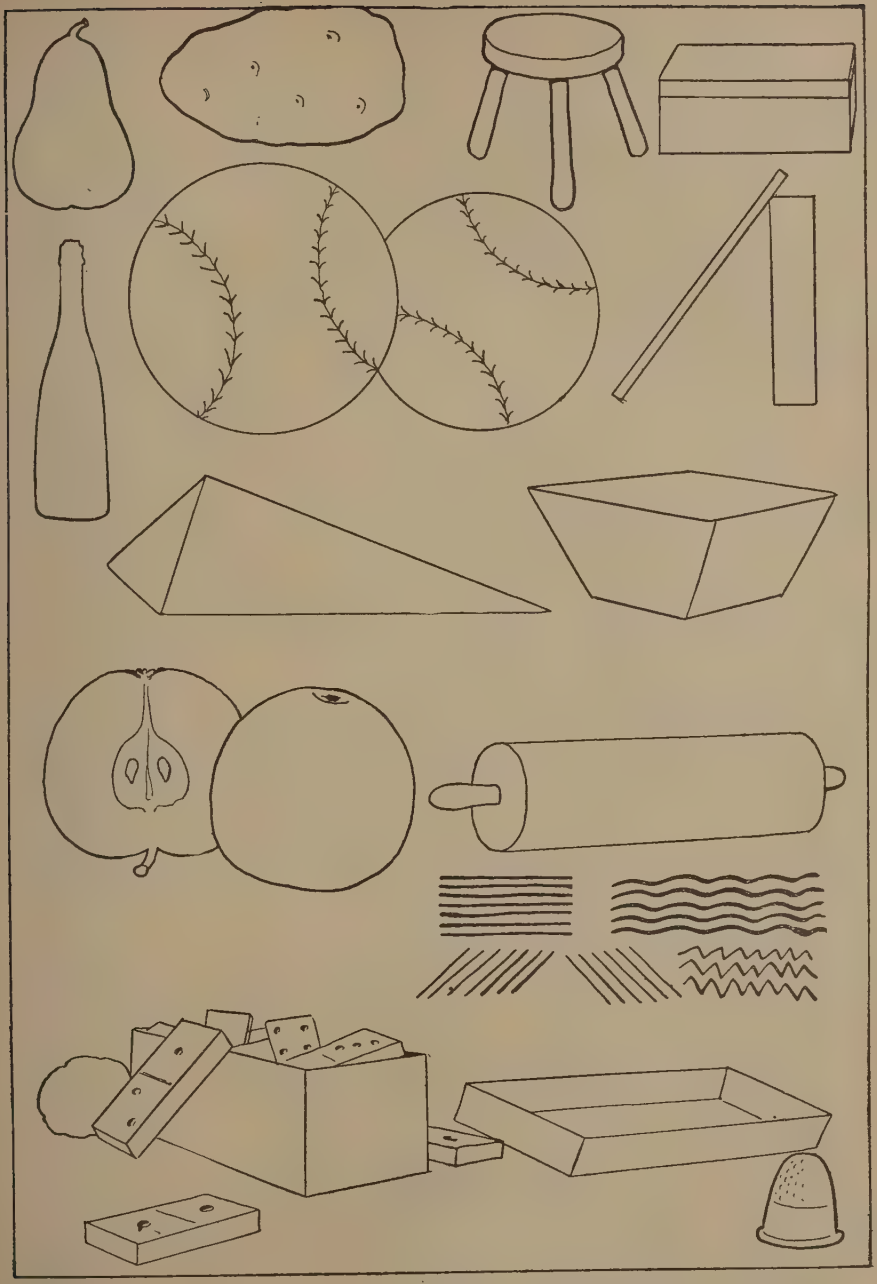
SHADE. That part of a model which is not in direct light.

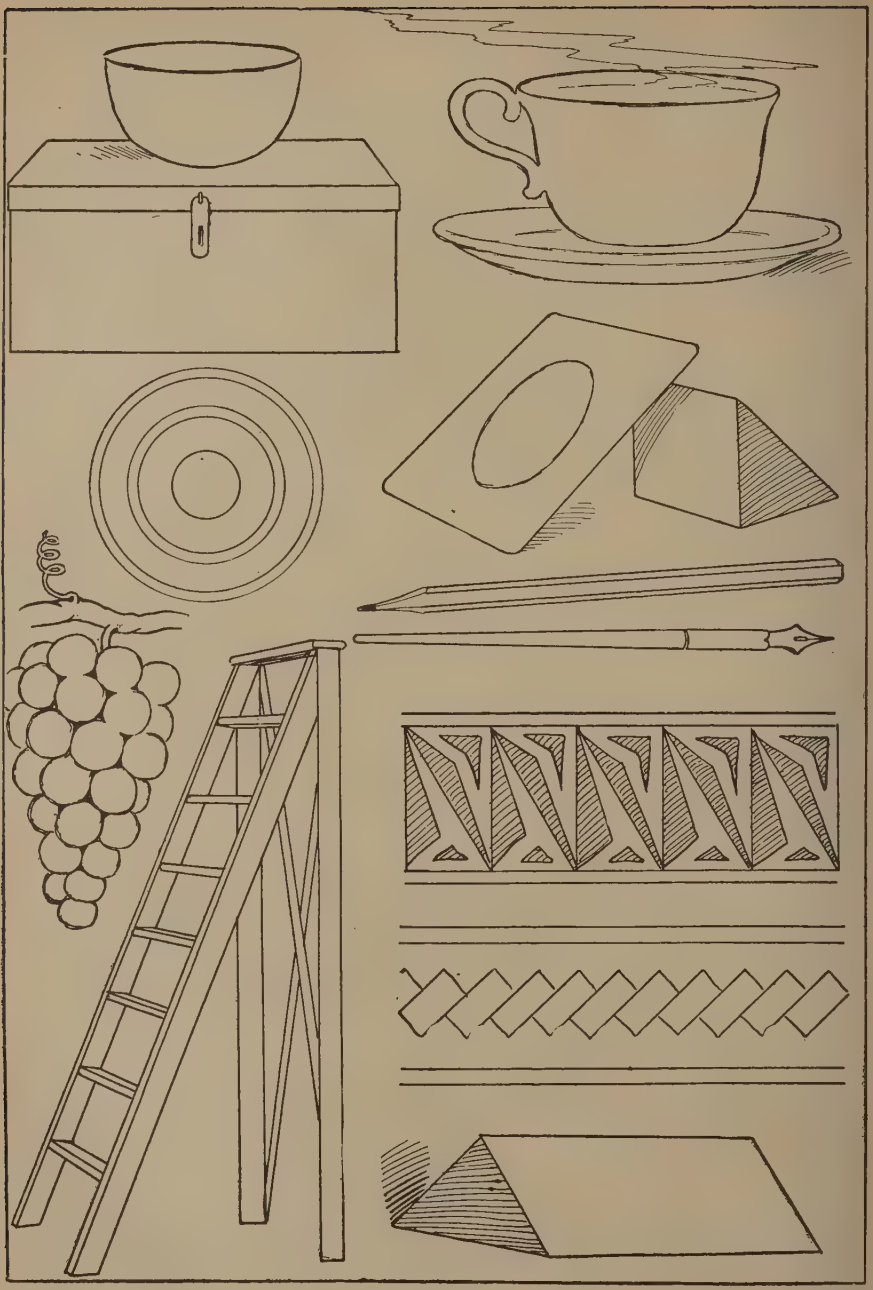
SHADOW. The part of a surface near the model which is shaded by the model.

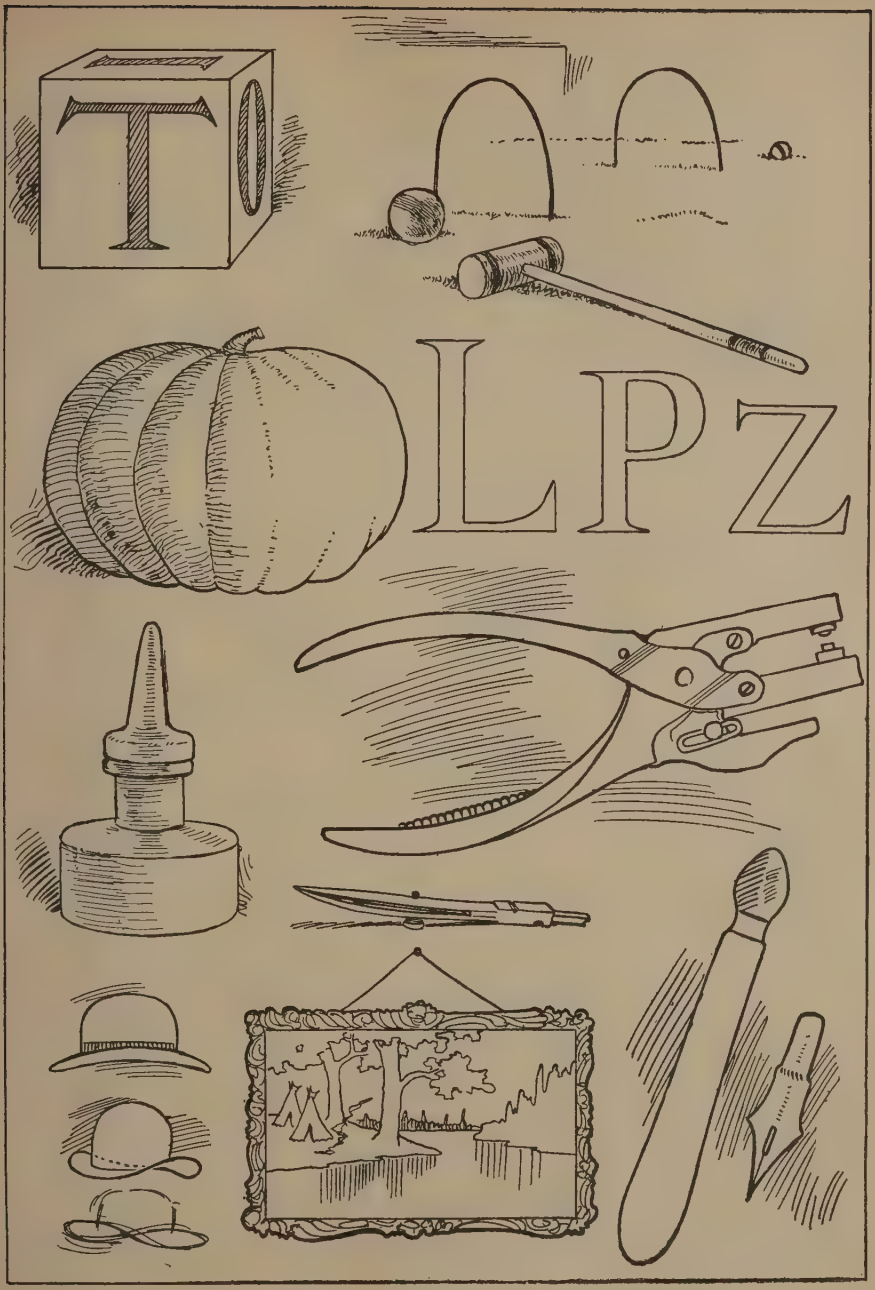
CONSTRUCTION LINES. Lines drawn lightly at the beginning to help locate and form the real outline of the object.

PLAN. The areas of a model when seen from above.

ELEVATION. The appearance of a model when seen from one side.



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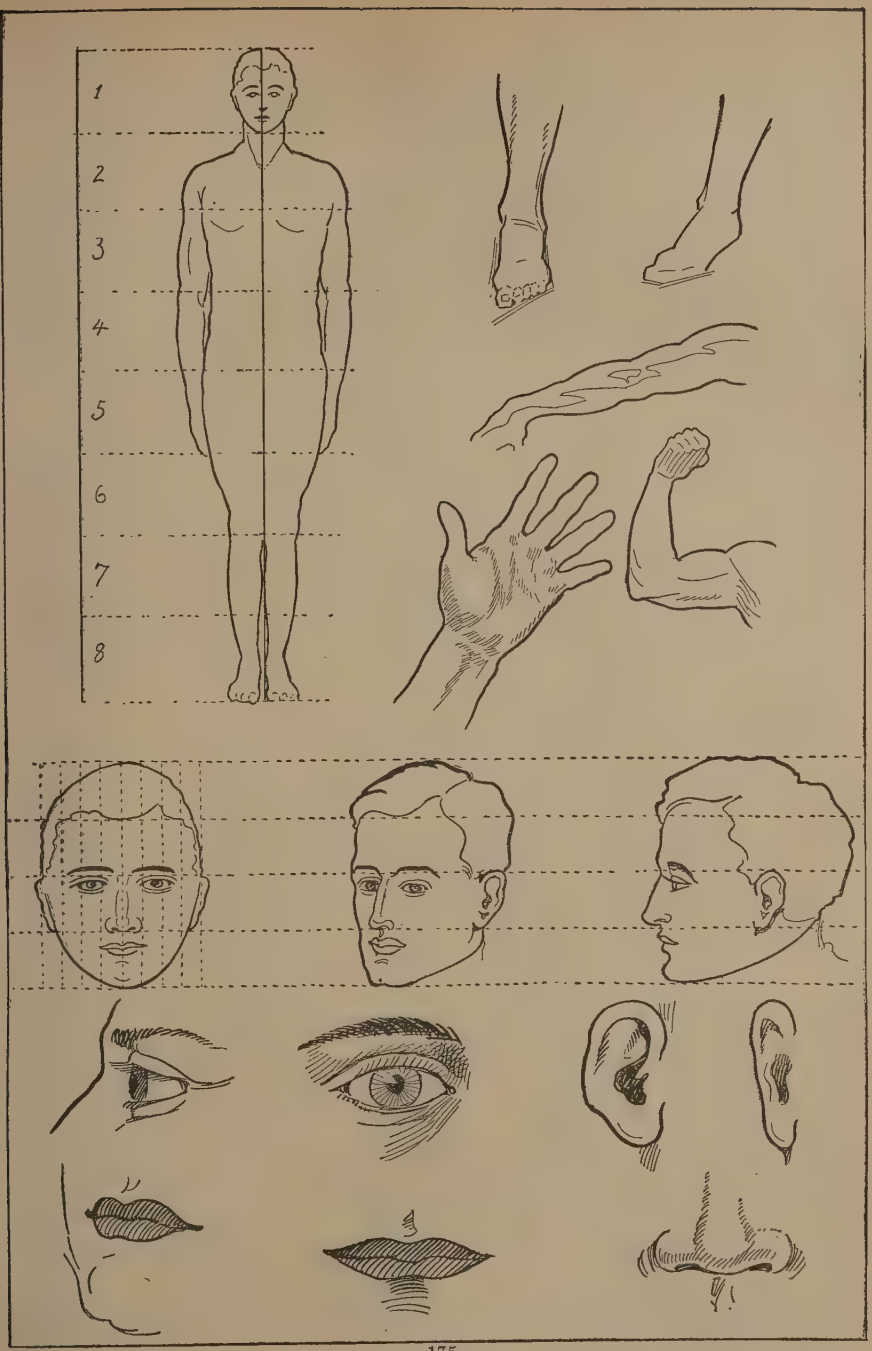
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Blackboard Drawing

FOR THE PUBLIC SCHOOLS.

The ability to draw well depends very largely upon a person's conception of perspective drawing. Much of the time and labor of pupils are wasted by teachers who have not conceived its principles. Unless pupils are trying to express form by their lines and shades they are working for little or no purpose.

An understanding and application of the principles of perspective drawing will awaken the sympathetic nature and appeal to the imaginative and constructive faculties of the child mind. As a guide and instructor for teachers and pupils in this most serviceable branch we give a few drawings in perspective, developing a street view from an elevation.

DIRECTIONS FOR DRAWING.

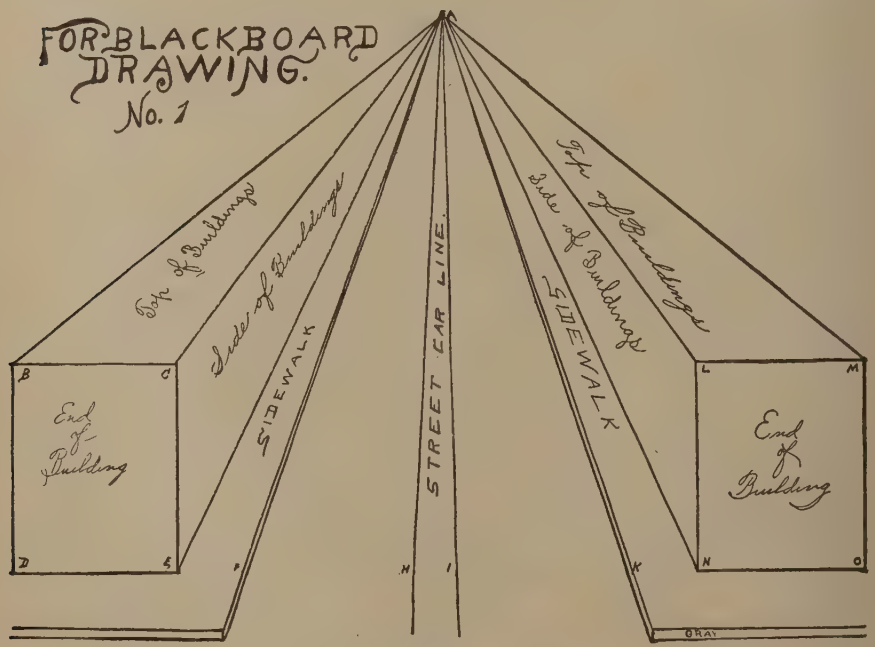
View No. 1. Show guide lines for buildings, sidewalks and street car lines, all drawn from point "A" (vanishing point).

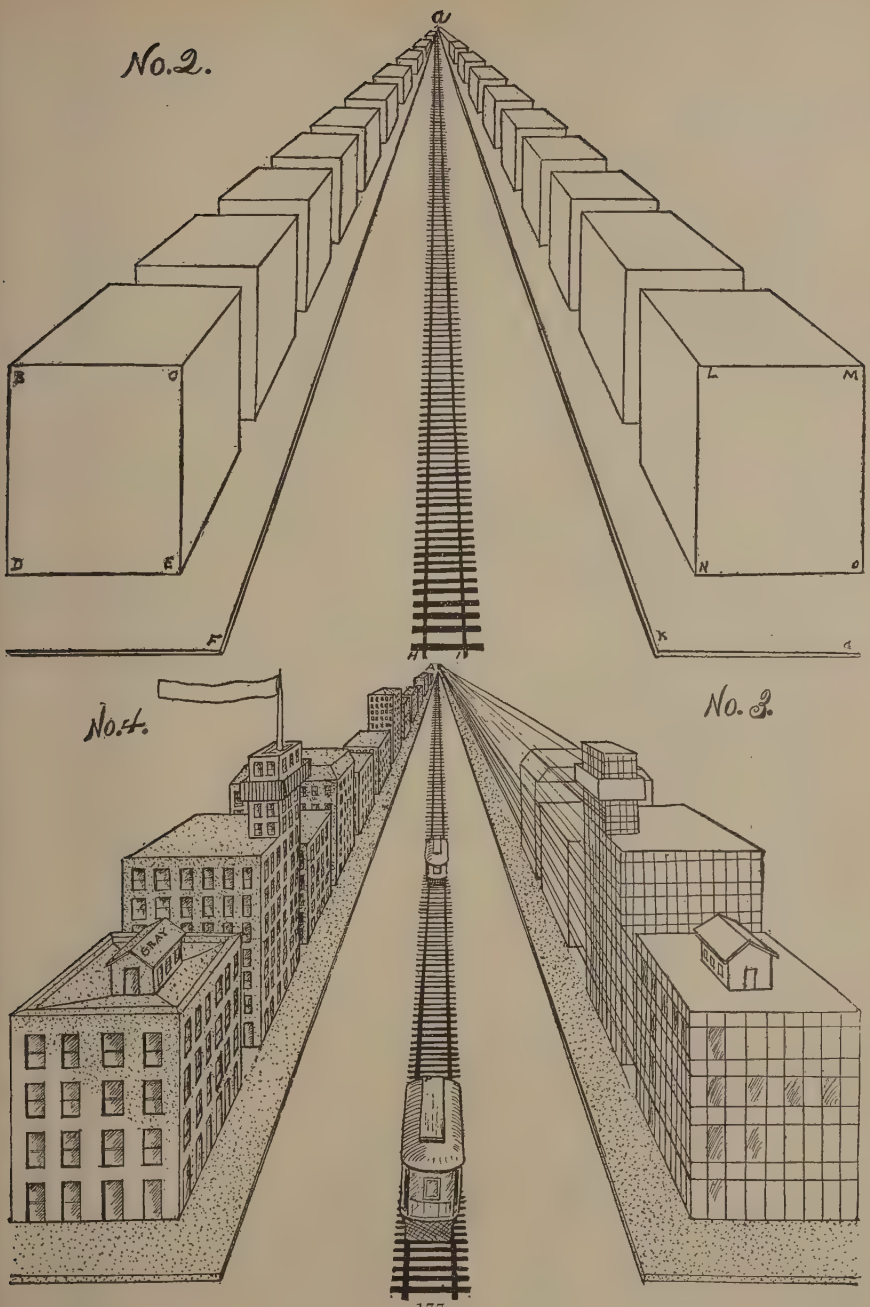
View No. 2. Develop into boxes by lines. Shade, and erase guide lines.

View No. 3. Modify boxes into buildings. Draw top and bottom guide lines for windows on end of building. Connect these lines with vanishing point "A" for side window guide lines. Draw all lines vertical to show sides of windows. Shade sidewalk.

View No. 4. Erase window guide lines and shade windows and buildings. Draw street cars.

Use a straight edge to develop these drawings on the blackboard. Make your drawings about three feet high by five feet wide. For shading, use the flat side of chalk and make it light or heavy by pressure and repetition. If you use colored crayons, it will add greatly to the effect.




No. 2.
a
B
C
D
E
F
L
M
N
O
K
No. 4.
No. 3.
GRAY

" 'Tis education forms the common mind,
As the twig is bent, the tree's inclined."—*Pope.*

Education

The department of EDUCATION in THE NEW PRACTICAL REFERENCE LIBRARY is divided into two general divisions. *Education* treats of the subject, first, in a general way, showing what education is and describing the different systems of education. This article is followed by another general article on the HISTORY OF EDUCATION. This begins with the earliest educational movements known in history and traces the successive steps down to the present time. Each important transition is indicated by subheads, as you will see by looking at the article. From the general view of the education of the world the subject passes to public education, treating first that in our own country, under the heads of *Common Schools, Evening Schools, Secondary Education, Academy, High School, College, University.* It then passes to the public education of other countries, which is described in the article *Education, National Systems of.* The next division of the subject is *Education of Special Classes,* which includes articles on the education of the blind, deaf and dumb, feeble-minded, indian and negro. Under some of these you will notice that special schools or other subjects are included. This indicates that these schools or these subjects are closely related to the education of the class under which they occur, as *Tuskegee Normal and Industrial Institute, Peabody Education Fund* and *Negro, Education of.* The next division, *Special Education,* treats of those special lines of instruction which have for their purpose training along certain well-defined lines. Under this subdivision you will notice the articles pertaining to industrial, commercial and professional education. The schools named in this division are those devoted especially to the class of work under which they are found. The division *Colleges and Universities* is very complete of our own and other leading countries. Women's colleges in the United States are also described. The division *Special Schools* includes such as the agricultural colleges, military and naval academies and reform schools.

The division *Educational Organizations* includes the important societies and associations of this country devoted to educational purposes, also the *British Association for the Advancement of Science.* The *Agassiz Association* and *Audubon Society* are both of interest to children, since they have become widely established among the school children over the United States.

LIBRARIES.

Since libraries are important educational aids, they have been classed under this department. The general article *Library* gives an excellent exposition of the library movement and contains brief descriptions of a number of the leading libraries in the United States and other countries. You will notice that this list closes with the *Library of Congress,* the most important institution of the kind in America.

MUSEUMS AND EDUCATIONAL EXTENSIONS.

The division *Museums* is inserted under *Education* for the same reason that the division *Libraries* is, and is treated in the same comprehensive way. The educational extension movements include such organizations having for their purpose the spread of education among people who are so situated that they can not attend regular schools of either secondary or college grade.

EDUCATION.

I. EDUCATION. General article, including a definition of the term and classification of the systems of education.

II. EDUCATION, HISTORY OF. General article, containing sketch of educational movements from the earliest history to the present time.

III. PUBLIC EDUCATION.
- 1. Common Schools.
- 2. Evening Schools.
- 3. Secondary Education.
  - a. Academy.
  - b. High School.
- 4. College.
- 5. University.
- 6. Education, National Systems of.

IV. EDUCATION, SPECIAL CLASSES.
- 1. Blind, Education of.
- 2. Deaf and Dumb, Education of.
- 3. Feeble-Minded, Education of.
- 4. Indian, Education of.
  - a. Hampton Normal and Industrial Institute.
  - b. United States Normal and Industrial Training School.
- 5. Negro, Education of.
  - a. Tuskegee Normal and Industrial Institute.
  - b. Peabody Educational Fund.
  - c. John F. Slater Fund.

V. SPECIAL EDUCATION.
- 1. Kindergarten.
- 2. Manual Training.
  - a. Sloyd.
- 3. Technical Education.
  - a. Polytechnic Schools.
  - b. Cooper Union.
  - c. Drexel Institute.
  - d. Massachusetts Institute of Technology.
  - e. Pratt Institute.
  - f. Carnegie Institution.
- 4. Commercial Education.
- 5. Professional Education.
  - a. Dental Schools.
  - b. Journalism, School of.
  - c. Law Schools.
  - d. Medical Schools.
  - e. Normal Schools.

VI. COLLEGES AND UNIVERSITIES. All state universities and the other large universities of the United States, like University of Chicago, Cornell

University, Princeton University, and all the important colleges, such as Dartmouth College, Amherst College, and the colleges for the education of women—Smith, Vassar, Wellesley, Bryn Mawr—together with the leading universities and colleges of Europe, are included in this subdivision.

VII. Special Schools.
1. Agricultural College.
2. Agricultural Experiment Station.
3. United States Military Academy.
4. United States Naval Academy.
5. Reform Schools.

VIII. Educational Organizations.
1. Agassiz Association.
2. Audubon Society.
3. American Forestry Association.
4. American Association for the Advancement of Science.
5. British Association for the Advancement of Science.
6. National Educational Association.

IX. Libraries.
1. Library.
2. Alexandrian Library.
3. Bibliotheque Nationale.
4. Library of Congress.

X. Museums.
1. Aquarium.
2. British Museum.
3. National Museum of the United States.
4. Smithsonian Institution.

XI. Educational Extension Movements.
1. Chautauqua Literary and Scientific Circle.
2. Correspondence Schools.
3. Lyceum.

XII. Biographies of Leading Educators. This division includes an extended list of biographies of the educators whose work has produced a marked effect upon the educational history of the world. The list includes both American and European educators of note.

QUESTIONS ON EDUCATION.

What is the purpose of physical education?
What is the aim of intellectual education?
With what does moral education deal?
What is included in primary education?
What instruction is included in secondary education?
What is higher education?
What is the purpose of professional education?
How is special education supported in the United States?

History of Education:

What is meant by education? How old is it?
What was a common characteristic of the education of the oriental nations?
What characteristic of the Hebrew education was in marked contrast to the educational systems of other oriental nations?
Which was the more complete, the Spartan or the Athenian education?

Was the early Roman education practical or æsthetic?

How did the introduction of Greek culture affect it?

To whom do we owe the preservation of the masterpieces of classic literature?

By whom were the most influential movements in the interest of general education made?

What was the culmination of all these movements?

MODERN EDUCATION:

How are modern methods of instruction in elementary schools traceable to the Reformation?

Through what religious organization did the Catholic church establish and maintain a high order of schools?

How long after the Reformation until public education was removed from the control of the church to that of the state?

What state furnished the model after which the public school of our northern colonies patterned?

When was Harvard College opened?

When and where was William's and Mary's College opened?

What were the most important causes in bringing education in the United States to its present degree of efficiency?

QUESTIONS.—KINDERGARTEN.

What does "kindergarten" mean? Who established the first kindergarten? Who was Froebel? When did he live? Children of what age attend the kindergarten?

What is the principle of kindergarten training? A model kindergarten should be how large?

In what country are kindergartens common? When was the work introduced systematically in the United States?

What colleges provide means for a thorough training for kindergarten teachers?

QUESTIONS.—LIBRARY.

Where and when were libraries first established?

What is the most noted library of ancient times?

What invention gave great impetus to libraries?

Where is the largest library in the world today, and how many million volumes does it contain?

Name five noted libraries of Europe, giving location.

What is the most noted library in the United States?

Name ten of the most important in our own country.

How many in the United States?

What are traveling libraries?

Describe the Library of Congress. What did the building cost?

QUESTIONS.—ALPHABET.

What is the oldest of all alphabets?

By what means were the Egyptian characters transformed into Phœnician letters?

How many letters in the original Greek alphabet? The Phœnician? Latin?

Is an alphabet essential to the writing of a language?

What is unusual about the Chinese mode of written expression?

QUESTIONS.—Common Schools.

What is meant by common schools?

Early History:

What was the system of education in the ancient oriental nations?

To what classes was education confined?

What two great rulers extended the educational influence of their empires during the middle ages?

From what ranks did the teachers come?

Reformation:

What two great events led to the establishment of public schools throughout Europe?

What great leader made public schools a necessity to his followers?

What made it possible to supply the people with books?

Establishment of Common Schools:

What countries were the first to establish common schools?

What war in Europe greatly hindered the progress of education?

France:

What events in France made government aid impossible in that country?

Where were public schools under state aid finally founded?

What country of Europe was the first to establish and support common schools?

England:

Why were the common schools of England called board schools?

When were they established?

Why were the early elementary schools of England known as dame schools?

United States:

When and where were the first schools established in the United States?

How were they maintained?

What two colonies were the next to follow?

What important part did the Swedish colonists take in education?

When and in what colony was a system of public schools organized by the Dutch?

What system of education was established in the southern colonies?

What condition in early times made free public schools odious, hindering their progress?

When was the Public School Society of New York formed? For what purpose? What did the plan include? Results?

Support:

What ordinances provided for the first grant of public lands?

How many acres are included in the congressional land grants?

What led to state control of the school funds?

In what way does Illinois derive a revenue from her school lands?

What is meant by the district system? Township? City?

Who is at the head of the department in every state?

How many pupils are enrolled in the common schools of the United States?

How many teachers are employed?

Manual Training

ORIGIN AND INTRODUCTION.
1880 Washington University.
1882 Dwight School.
Sloyd System.
1903 National Educational Association.
1905 Committee Report.

PURPOSES.
To enable the child to enlarge his powers of expression.
To make him acquainted with the nature and use of the most common materials.
To lead him to develop a certain degree of skill in the use of tools.
To develop his originality.
To connect the work of school with the affairs of everyday life.

VALUE—Practical
It increases the pupil's power to do.
It gives a degree of skill in the use of tools.
It schools in the value of material.
It teaches the dignity of labor.

VALUE—Cultural.
It demands concentration of attention.
It requires organized thinking.
It demands an exercise of the will power.

DANGEROUS TENDENCY.

NEED OF TRAINED TEACHERS.

CORRELATED SUBJECTS.

BIBLIOGRAPHY.

QUESTIONS.

Is manual training instruction a regular feature in the school system of every large city?

Why did the committee not recommend the general introduction of such teaching in one-room schools?

Should such instruction be given only for its utility value?

Should teachers be selected from among artisans, or must they be professionally trained to be successful?

At what time in school work should manual training be introduced?

What department of the elementary schools are closely allied with manual training?

Does the instruction have a distinct industrial value for those who may earn a living by their hands?

What is the first essential of good citizenship?

Distinguish between technical education and manual training.

Sloyd was first introduced into the schools of what countries? Who extended the system?

Basketry

I. Woven Baskets.
   1. Form.
      a. Twill work.
      b. Wicker work.
      c. Checker work.
      d. Twined work.
   2. Material.
      a. Splints.
      b. Rods.
      c. Braid or bark.

II. Coiled Baskets.
   1. Style.
      a. Open work.
      b. Close or stitched.
   2. Material.
      a. Raffia.
      b. Rods.

QUESTIONS.

What people make baskets from raffia so small that they could be passed through a lady's finger ring, and others larger than a barrel?

What place has basketry among the mechanic arts?

In what ways do the American indians excel all other uncivilized tribes in this art?

The manufacture of baskets includes what?

Upon what does the labor and process depend?

What is the simplest form of woven basketry?

Of what does *twill* work consist?

Among the Rocky Mountain indian tribes what style is common?

How are *coiled baskets* made?

What is a striking feature of coiled baskets among the indians?

By what means does the basket-maker add to the grace and beauty of the basket?

Why has basketry been adopted for a portion of the industrial work in the schools?

What is raffia? What are textiles?

What style of basket-making is represented in Figure 5 in the illustrations?

Much as a man gains from actual conflict with living minds, he may gain much even of the same kind of knowledge, though different in detail, from the accumulated thinking of the past. No living generation can outweigh all the past. If books without experience in real life cannot develop a man all around, neither can life without books do it.

There is a certain dignity of culture which lives only in the atmosphere of libraries. There is a breadth and a genuineness of self-knowledge which one gets from the silent friendship of great authors without which the best work that is in a man cannot come out of him in large professional successes. —*Phelps.*

The value of a library depends not upon the number of its books but upon their character.
—*Carlyle.*

Geography

The study of GEOGRAPHY was formerly made from the standpoint of the description of the earth's surface, but we now study it as the abode of man.

Since the relation of the earth to man is the central idea, the things immediately at hand should be studied first. In the outline submitted we begin with the school district, township, city and county. You, of course, would not expect to find in any general reference work local data to supply this information, but with the assistance of this Classified Topical Outline the information can be easily secured, and is of practical value.

Your own county and state have a geography more fascinating and interesting than any other country; yet our pupils, and not infrequently our teachers, know more of the jungles of AFRICA or the ARCTIC wilds than of their own commonwealth.

These outlines covering local geography are followed by general outlines applicable to any city, any state and any country.

In addition to the general outline we are more specifically taking BOSTON as a city, CALIFORNIA as a state, UNITED STATES as a country and AFRICA as a grand division, and from the information which we furnish in THE NEW PRACTICAL REFERENCE LIBRARY, have developed model outlines which a student can adapt to his study of the various divisions and subdivisions.

It is not the aim of the editor to make this series of outlines exhaustive, but suggestive, and to furnish such models that the ambitious teacher and aspiring pupil can have suitable direction along the line of self-culture, which is the only practical education.

Geography in its true sense will bring before the student the products of the soil and the mill; the location of commercial highways; the effect of climate upon the productions and the peoples; the study of the natural resources which supply food and occupations of men; the reasons for the founding of cities at proper localities rather than elsewhere; the forms of government; the religion as practiced in the various countries, etc.

The study of geography in this way will give us the location of places, boundaries, etc., incidentally, and such information will become secondary and will be fixed in the mind permanently without a special study of same.

Physical, Mathematical, Political

Geography is divided into the great departments *Physical Geography* or *Physiography* (see *Physiography*), *Mathematical Geography, Political Geography,* which depends upon the other two divisions. Geography cannot be well taught without a thorough knowledge of the subject and a knowledge of correct methods of teaching. See *Geography, Methods of Teaching.*

Local Geography

I. School District.

1. Area.
2. Sections included.
3. Dimensions.
4. Bound by districts.
5. Census.
6. Population to square mile.
7. Per cent attending school.
8. Assessed valuation.
9. Per cent tax levy.
10. Cost of one year's schooling.
11. Who pays it?
12. Officers, duties, etc.
13. Map district—streams, houses, etc.
14. Historical.

II. Township.

1. Area.
2. Position.
3. Extent.
4. Bound by townships.
5. Congressional.
6. Municipal, civil.
7. Range.
8. Physical features.
    a. Streams, lakes, ponds.
    b. Forests, groves.
9. Advantages.
10. Improvements.
    a. Churches, schools, etc.
11. Township organization.
12. Officers.
13. Towns.
14. Old settlers.
15. Map.

III. City.

1. Class.
2. Charters.
3. Officers.
    a. Names.
    b. Duties.
    c. Terms.
    d. Salaries.
4. Levying and collecting taxes.
5. Administration of justice.
6. Police inspection.
7. Fire department.
8. Care of streets.
9. Sewerage.
10. Water supply.
11. Municipal ownership.
12. Municipal government.
13. Public parks, buildings, boulevards, etc.
14. Prisons.
15. Supervision of the liquor traffic.
16. Regulation of street railways.
17. Subways.
18. Building regulations.
19. Transportation.
20. Suburbs.
21. Supervision of charities.
22. Position and extent.
23. Commerce and industry.
24. History.
25. Population.

IV. County.

1. Define.
2. How change boundary.
3. Dimensions.
    a. Extent.
    b. Area.
4. Shape.
5. Boundaries.
6. Latitude.
7. Longitude.
8. Position in state.
9. Relief.
    a. Mean elevation.
    b. Highest elevation.
    c. Comparative elevation.
10. Population.
    a. Square miles.
    b. Increase in ten years.
    c. Per cent of increase.
    d. Rank.
11. Schools.
    a. Enumeration.
    b. Enrollment.
    c. Per cent enrollment of enumeration.
    d. Graded.
    e. District.
    f. Private.
    g. Number of districts.
12. Railroads.
    a. Steam and electric.
    b. Names.
    c. Miles.
13. Townships.
    a. Names.
    b. Number.
    c. Congressional.
    d. Municipal.
    e. Largest, smallest.
14. Range and township numbers explained.
15. County officers.
    a. Names.
    b. Duties.
    c. Terms.
    d. Salaries.
16. Streams.
17. Lakes and ponds.
18. Resources.
19. Towns, with population.
20. Metropolis.
21. County seat—why so called?
22. Highest building.
23. Public buildings and institutions.
24. Manufactures.
25. Newspapers.
26. Historical.
    a. When settled.
    b. When organized, etc.
27. Map—Use quadrille paper for beginners, counting each square one mile, or one-fourth mile, according to the size of your paper.

State Geography

I. Popular Names.
II. Location.
  1. Latitude and longitude.
  2. Position in the country.
  3. Boundaries.
III. Extent.
  1. Length.
  2. Breadth.
  3. Area.
IV. Size.
  1. Absolute.
  2. Relative.
V. Trend.
VI. Outline.
  1. Form.
  2. Regular or irregular.
VII. Coast Line.
  1. Length.
  2. Indentation.
  3. Projections.
VIII. Surface.
  1. General idea.
  2. Watersheds.
  3. Hills and mountains.
  4. Plains.
IX. Natural Curiosities.
X. Drainage.
  1. River systems.
  2. Special streams.
  3. Sources—lakes and springs.
XI. Climate.
  1. Causes.
  2. Healthfulness.
  3. Adaptation to industries.
  4. Compare with other localities.
XII. Industries.
XIII. Products.
  1. Agricultural.
    Crops.
    Domestic animals.
    Dairy, etc.
  2. Mineral. Fuel. Ores.
  3. Manufacturers.
XIV. People.
XV. Cities.
XVI. Internal Improvements.
XVII. Commerce.
  1. Railways and canals.
  2. Navigable rivers.
  3. Commercial centers.
XVIII. Government.
XIX. Civil Divisions.
XX. Education.
  1. Common schools.
  2. Higher institutions.
  3. Eleemosynary institutions
XXI. State Institutions.
XXII. Historical.
  1. Settlement.
  2. Admission.
  3. Places of historical interest
XXIII. Miscellaneous.

United States

I. Location.
II. Boundary.
III. Extent.
IV. Coastal Features.
V. Surface and Drainage. (See Relief Map.)
  1. The Atlantic Slope.
  2. The Appalachian Highlands
  3. The Great Plain.
  4. The Rocky Mountain Highlands.
  5. The Pacific Slope.
  6. Rivers.
  7. Lakes.
VI. Climate.
  1. Temperature.
  2. Rainfall. (Rain Map.)

Note.—Since thinking in images is easier for beginners than thinking in symbols, the instruction in geography should begin with child-life at home, with the things on the breakfast-table, with the garments worn and the means of transportation used, and proceed from these to the life, the home, the dress, and the sports of children living in other lands and other climes. The lessons in geography make constant appeals to the imagination, and call for thinking in images or mental-pictures in connection with map-symbols and the discussions of causes and laws. *—From Schaeffer's "Thinking and Learning To Think."*

VII. Mineral Resources.
- 1. Coal. (See Coal.)
- 2. Petroleum. (See Petroleum.)
- 3. Iron. (See Iron.)
- 4. Gold and silver. (See Gold; Silver.)
- 5. Other metals.
- 6. Building stones.

VIII. Vegetation.

IX. Animal Life.

X. Agriculture.
- 1. Cereals.
- 2. Cotton and tobacco.
- 3. Other crops.
- 4. Live stock.

XI. Fisheries.

XII. Manufactures.
- 1. Resources and causes of development.
- 2. Location of manufacturing districts.
- 3. Leading industries.
  - a. Iron and steel.
  - b. Textiles.
  - c. Leather.
- 4. Other industries.

XIII. Transportation and Communication.
- 1. Waterways.
- 2. Railroads.
- 3. Roads.
- 4. Communication.

XIV. Commerce.
- 1. Domestic commerce.
- 2. Foreign commerce.

XV. Population.
- 1. Increase in population. (Table.)
- 2. Movement westward. (Map.)
- 3. Density. (Map.)
- 4. Growth of cities.
- 5. Immigration.
- 6. Color.
- 7. Present character.

XVI. Government.
- 1. General character.
- 2. Legislative department.
- 3. Executive department.
- 4. Judicial department.
- 5. Colonial possessions.
- 6. State government.
- 7. Territories.
- 8. Finance.

XVII. Political Divisions.
(See Table.) (This table gives the name of the state, its popular name, area, date of admission into the Union, population, colored population, and number of representatives in congress.)

XVIII. Education.

XIX. Literature.

XX. Art.

XXI. Cities. (Table.)

XXII. History.
- 1. Discovery and exploration.
- 2. Colonization.
- 3. Colonial development.
- 4. Development of Union.
- 5. Revolutionary War.
- 6. Articles of Confederation.
- 7. Organization of the national government.
- 8. Supremacy of the Anti-Federalists.
- 9. The era of good feeling.
- 10. John Quincy Adams.
- 11. Democracy again in power.
- 12. Texas and the Mexican War.
- 13. Downfall of the Whigs.
- 14. Slavery.
- 15. Civil War.
- 16. Reconstruction.
- 17. Industrial progress and problems.
- 18. Financial panic of 1893.
- 19. Expansion. (Table.)
- 20. Recent progress.
- 21. Bibliography.

Note.—In the great journal of things happening under the sun we, the American people, find ourselves in the peaceful possession of the fairest portion of the earth as regards extent of territory, fertility of soil and salubrity of climate.

—*Abraham Lincoln.*

Compare the areas of New York and Minnesota.

California is how many times the size of New Jersey?

Why is the Hudson of more importance to commerce than the Colorado?

What interferes with navigation on the Missouri River?

How does the Mississippi compare in length with the Volga?

Which has the greater volume of water, the Mississippi or the Amazon?

What river is of the oldest historic importance?

What are the Palisades of the Hudson?

Where is the Natural Bridge?

What bodies of water would you pass through in going from Superior to New York City?

What is the area of Yellowstone National Park?

What commercial advantages has Chicago?

How does the United States compare in size with Australia?

What principal cities would you pass in going by boat from St. Paul to New Orleans?

What bodies of water would you pass through in going from New York to Yokohama by way of Suez Canal?

How many cities has the United States with a population over 1,000,000? Over 500,000? Over 100,000? Name several.

When was your state admitted into the Union?

By the last census how many negroes resided in your state?

How many representatives are sent to congress by your state? What must be the increase in population before another can be added to the list?

By referring to the product map in article on United States, what states do you say constitute the spring wheat belt? The cotton group? The live stock territory? The wool regions? The fruit sections? Give reasons for your answer.

Where was the center of population of the United States in 1800? In 1850? In 1870? In 1900? (See outline map in article on United States.) How has the center of population traveled? Has it fluctuated much from north to south? What is remarkable about its progress?

Assuming the center of population will travel westward at the rate it has since 1860, where will it be in 1930? When will it reach Missouri? When Kansas, within whose borders is the geographical center of the country?

What was the percentage of increase in population of the United States from 1800 to 1810? From 1890 to 1900? Is the percentage increasing or decreasing?

While the size of California and Japan is approximately the same, how do they compare in population?

What state is popularly known as the Blue Grass State? Nutmeg State? Diamond State? Equality State? Sage Brush State? Flickertail State? What is the popular name of your own state?

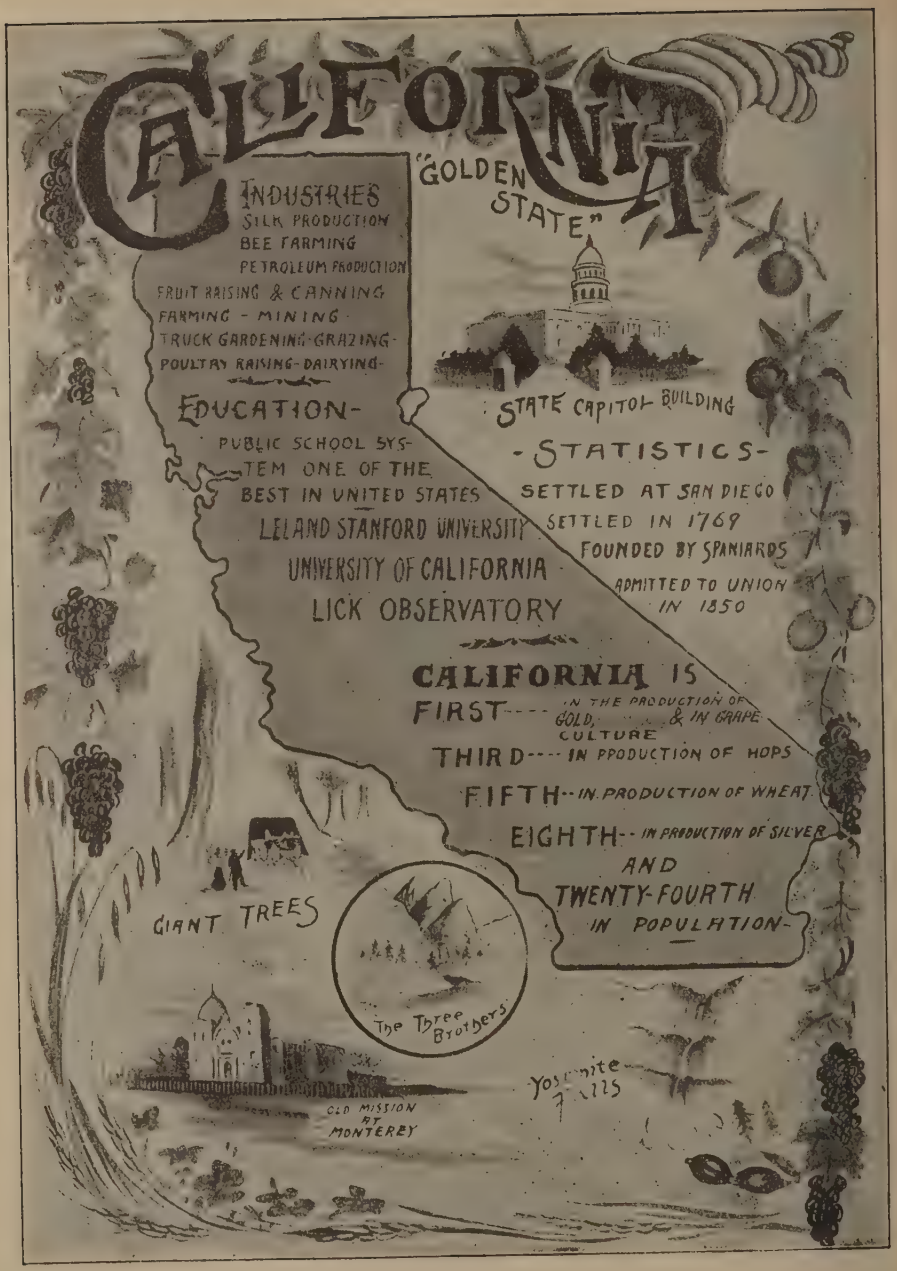
What would be the population of Texas if as thickly settled as Rhode Island? How many Rhode Islands could be carved from Texas? How many from Pennsylvania? From Iowa? From California?

From observation of the map, what state is bounded on the north and east by the Mason and Dixon's line?

Which is farther north, St. Paul, Minn., or Augusta, Me.?

Which is farther south, San Antonio, Texas, or Tampa, Florida?

What are the abbreviations (which see) of the following: Louisiana, Maryland, Utah, Oklahoma, Long Island, Alaska?


CALIFORNIA
"GOLDEN STATE"
INDUSTRIES
SILK PRODUCTION
BEE FARMING
PETROLEUM PRODUCTION
FRUIT RAISING & CANNING
FARMING - MINING
TRUCK GARDENING-GRAZING
POULTRY RAISING-DAIRYING
EDUCATION-
PUBLIC SCHOOL SYSTEM ONE OF THE BEST IN UNITED STATES
LELAND STANFORD UNIVERSITY
UNIVERSITY OF CALIFORNIA
LICK OBSERVATORY
STATE CAPITOL BUILDING
-STATISTICS-
SETTLED AT SAN DIEGO
SETTLED IN 1769
FOUNDED BY SPANIARDS
ADMITTED TO UNION IN 1850
CALIFORNIA IS
FIRST---- IN THE PRODUCTION OF GOLD, & IN GRAPE CULTURE
THIRD---- IN PRODUCTION OF HOPS
FIFTH--IN PRODUCTION OF WHEAT
EIGHTH--IN PRODUCTION OF SILVER
AND
TWENTY-FOURTH
IN POPULATION-
GIANT TREES
The Three Brothers
Yosemite
OLD MISSION AT MONTEREY

California

HISTORY.
Spanish Explorations.
(a) Cabrillo
(b) Drake
Mexican territory admitted as a State?

AGRICULTURE.
Grains
Fruits
(a) Oranges
(b) Prunes
(c) Grapes
(d) Nuts
(1) Almonds
(2) Walnuts
Vegetables

CITIES.
Sacramento
San Francisco
Los Angeles
Oakland
San Jose
Stockton

EDUCATION.
Public schools
High schools
Normals
Universities
State institutions

SURFACE.
Mountains
Rivers
Valleys
Lakes
Plains

MANUFACTURES.
Shipbuilding
Sugar refineries
Olive oil
Lumber
Canning

TRANSPORTATION.
Railways.
(a) Steam
(b) Electric
Commerce.
(a) Rivers
(b) Ocean
(c) Harbors

CLIMATE.
Ocean currents
Winds
Altitude
Rainfall
Latitude

TEST QUESTIONS ON CALIFORNIA.

What white explorers visited California almost a hundred years before the settlement of Jamestown?

From what does California take its name? What was its first name?

How does the length of California compare with the distance from Indianapolis to New York City?

How many Rhode Islands could be carved from the State? How many New Yorks? Ohios?

How does California rank in size with Texas? With Montana? With Norway?

What would be California's population if as thickly settled as Massachusetts?

Which has the larger population California or Chicago?

What city in California doubled its population between 1890 and 1900?

How does San Francisco compare in population with Baltimore? St. Louis? New Orleans?

How does the output of the gold mines compare in value with the fruit industry?

Name five of the leading fruits of California found in your grocery store?

How many thousand carloads of oranges are produced every year?

What natural advantages has California for foreign trade?

What distinguishes the public school system of California?

In what year did the first American emigrant wagon reach the State?

At the breaking out of what war was California declared a republic?

When and by what treaty was it ceded to the United States?

What discovery led to an influx of settlers from all parts of the world?

When was California admitted to the Union?

Why is the climate of California entirely different from the eastern states in the same latitude?

Explain why the same fruits grow in the northern part as in the southern?

To what is the mildness of the climate due? How is the year divided as to seasons?

Does the rainfall vary in different localities? Is irrigation necessary in certain sections?

How many acres are devoted to grape culture alone?

San Francisco

HISTORY.
- Mission established.
- Sudden growth.
- Prominence.
- Earthquake.
  - Fire.
  - Loss.
- Reconstruction.

DESCRIPTION.
- Situation.
- Size.
- Rank.
- Population.
  - Character.

COMMERCE AND INDUSTRY.
- Harbor.
- Foreign trade.
  - Value.
- Railroad ferries.
- Commission business.
- Manufactures.
  - Importance.
- Shipbuilding.

SITUATION.
- Hills.
- Residence section.
- Sand dunes.
- Business portion.

ITEMS OF INTEREST.

San Francisco is called the "Queen City of the Pacific Slope."

The United States mint in San Francisco was established in 1854.

San Francisco has the only natural harbor between Astoria on the north and San Diego on the south.

San Francisco is one of the principal cities of the Pacific coast, and its industries, wealth and fine buildings rival those in the east.

Perhaps the most interesting part of the city is the portion known as "Chinatown," where thousands of Chinese are crowded together, living in the same manner as they did at home. Special guides are needed to visit this part of the city, as there are many gambling houses and opium dens.

San Francisco is one of the most remarkable examples of rapid growth on record.

QUESTIONS.

How does this city rank in population with other cities in the U. S.?

On what is it situated? What does it comprise?

What is meant by the "Golden Gate"?

What gives this city its picturesque appearance?

What are the sand dunes? Of what benefit are they?

What part of the city is called the Mission? For what is it named?

How is the city divided? What are the divisions called and what do they comprise?

What is the most beautiful park found in this city? How does it rank with other parks in the world?

For what are the "Seal Rocks" noted?

What libraries were destroyed by the fire of 1906?

How does this city rank as a seaport? What is the value of her foreign trade?

What railroad facilities has this city? What connection with trans-continental railroad lines?

How did San Francisco get its name? What caused its sudden prominence?

What disaster occurred in 1906? Which caused the most damage, the earthquake or the fire which followed?

What precaution has been taken to eliminate all possibility of another such fire?

How does the population of this city resemble that of Chicago? New York?

Colorado

I. Popular Name.
II. Location.
  1. Latitude.
  2. Longitude.
  3. Position in U. S.
  4. Boundaries.
III. Extent.
  1. Length.
  2. Breadth.
  3. Shape.
  4. Area.
IV. Size.
  1. Absolute.
  2. Relative.
V. Population.
  1. Total.
  2. To square mile.
  3. Rank.
VI. Surface.
  1. Plains.
  2. Mountains.
    a. Ranges.
    b. Peaks.
  3. Water Shed.
VII. Drainage.
  1. Systems.
  2. Streams.
  3. Sources.
VIII. Climate.
  1. Causes.
  2. Varieties.
  3. Characteristics.
  4. Rainfall.
  5. Healthfulness.
IX. Resources and Products.
  1. Mineral.
  2. Agricultural.
    a. Irrigation.
    b. Crops.
    c. Grazing.
  3. Lumbering.
  4. Manufacturing.
  5. Transportation.
X. Education.
  1. Permanent Fund.
  2. Common Schools.
  3. State Institutions.
XI. Cities.
  1. Important ones.
  2. (Study your local town using our outline on Local Geography.)
XII. History.
  1. Meaning of name.
  2. Early explorations.
  3. How secured by U. S?
  4. Pike and Fremont.
  5. Discovery of gold.
  6. Admission.
  7. Woman suffrage.
XIII. Items of Interest.
  1. Garden of the Gods.
  2. Royal Gorge.
  3. Pike's Peak.
  4. Monument Park.
  5. Hot Springs.
  6. Beautiful Canyons.

INTERESTING FACTS.

Colorado is noted for a highly developed system of irrigation.

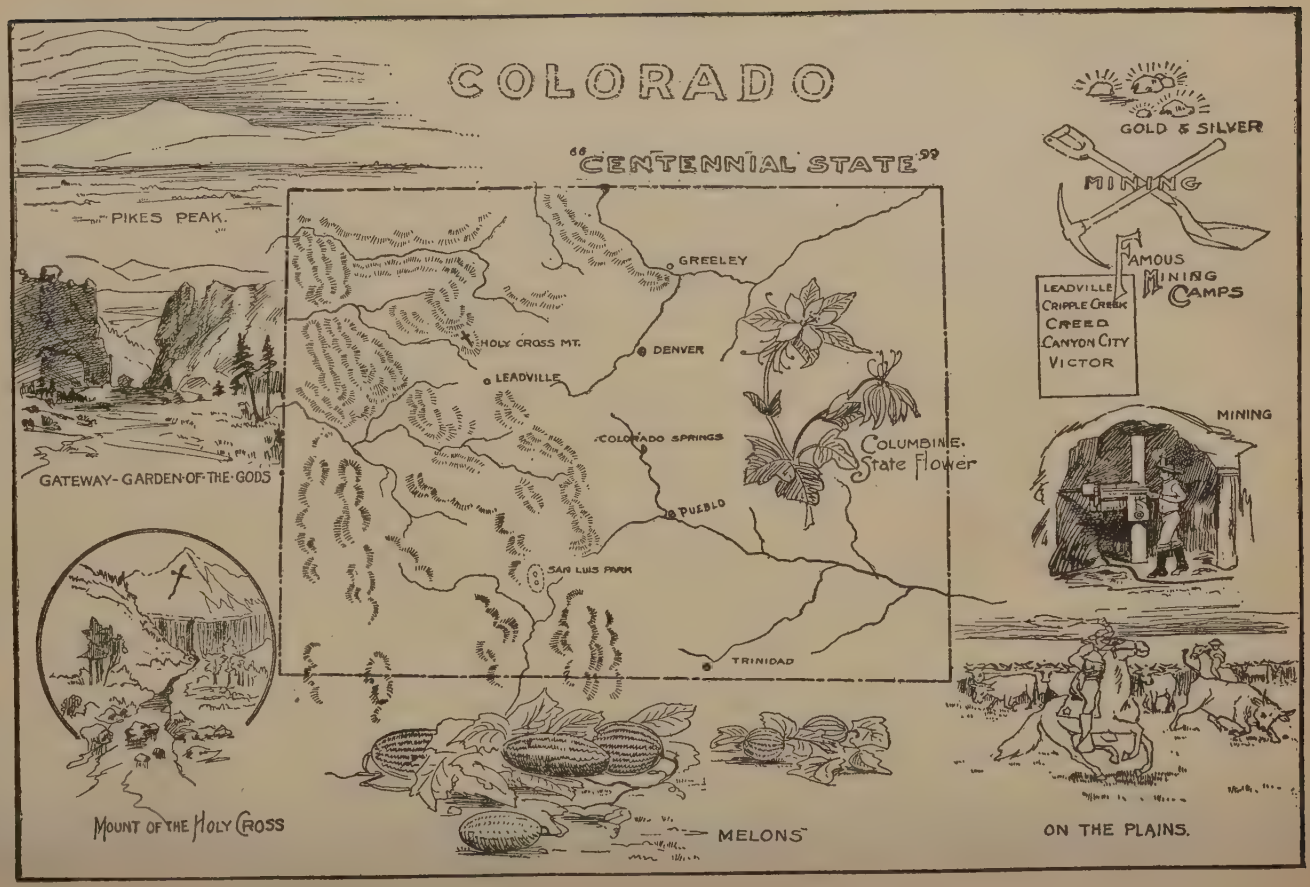
Colorado has the greatest game preserves in America.

Colorado contains the richest and most productive gold and silver mines in the world.

Colorado is a land of sunshine, three hundred and fourteen days of the year being clear in whole or in part.

It is larger than all New England States combined, with the State of Ohio added; it is larger than the four Middle States, and larger than England, Scotland and Wales combined.

In addition to and accompanying the irrigation development, what is known as the "Dry Farming" movement is making rapid progress in Colorado. The dry farming method of agriculture, sometimes known as the "Campbell System," consists of scientific methods of culture by which the moisture is conserved in the soil itself, instead of by means of reservoirs and ditches, and is adapted to lands where irrigation is not possible.


COLORADO
"CENTENNIAL STATE"
PIKES PEAK.
GATEWAY-GARDEN-OF-THE-GODS
GREELEY
HOLY CROSS MT.
DENVER
LEADVILLE
COLORADO SPRINGS
PUEBLO
SAN LUIS PARK
TRINIDAD
Columbine. State Flower
GOLD & SILVER
MINING
FAMOUS MINING CAMPS
LEADVILLE
CRIPPLE CREEK
CREED
CANYON CITY
VICTOR
MINING
Mount of the Holy Cross
MELONS
ON THE PLAINS.

TEST QUESTIONS ON COLORADO.

From what does Colorado take its name? What does it signify?

What is the general shape of this State?

How does the length of Colorado compare with the distance across the continent? How does its breadth compare with the breadth of the United States?

It is called the Centennial State because it was admitted 100 years after American Independence. In what year was that?

What proportion of the State's population is included in its largest city?

What would be Colorado's population if as thickly settled as Rhode Island?

Have any states bordering Colorado a greater area than Colorado?

What other states in the United States have a greater area?

How does Colorado compare in area with Texas? Germany? Norway?

Colorado is equal in area to how many 160-acre farms?

What are the results of its numerous spurs and cross ranges of mountains?

How many peaks over 14,000 feet high in this State?

Where does the Great Continental Divide cross the State? What effect does it have upon the rivers?

What are the characteristics of Colorado climate? What is the cause for the varied climate? How do you explain the fact that the temperature seems to differ from that indicated by the thermometer?

What is the average rainfall? Is this enough to produce crops?

How does the value of the yearly output of beet sugar compare with the amount of gold produced?

The value of the gold output constitutes what proportion of the mineral wealth?

At what price per ton would it be necessary to sell the output of coal to equal in value the annual production of gold?

Locate the following places on the sketch map and tell for what each is noted: Denver? Pueblo? Leadville? Colorado Springs?

How many acres under cultivation? What proportion of the entire area?

What is the value of the sugar beet industry? How many tons grow to the acre?

Name six important agricultural products.

What is said of the growth of apples and other fruits?

Name some of its trees valuable for lumber.

What is said of grazing?

How many miles of railroads in Colorado? What was the first line built? Name three of the most important lines.

What constitutes a permanent school fund? Where is the State University located? The School of Mines? The State Normal School? The Agricultural College?

In what century was Colorado first visited? By whom?

When was the State Capitol completed? At what cost?

Does any other state produce more gold than Colorado? More silver?

In what way does suffrage in this State differ from eastern states?

This State casts its electoral vote for which of the political parties?

What forms the gateway to the Garden of the Gods?

What is said of the canyons?

What is the State flower of Colorado?

What is the depth of the Royal Gorge? What is said of its picturesqueness?

How are tourists taken to the summit of Pike's Peak? How does the height of Washington's Monument compare with that of Pike's Peak?

Atlanta

THE GATE CITY.

SITUATION.
- In United States.
- In state.

DESCRIPTION.
- Size.
- Population.
- Area.
- Plan.

PARKS.
- Grant.
- Piedmont.

PROMINENT BUILDINGS.
- Capitol.
- Public buildings.
- Educational institutions.
- Libraries.
- Business blocks.

COMMERCE AND INDUSTRY.
- Facilities.
- Trade.
- Water power.
- Manufactures.

HISTORY.
- First home.
- Incorporation.
- Original name.
- Civil war.
- Capital.
- Cotton Exposition.

INTERESTING ITEMS.

Atlanta is called "The Chicago of the South."

Atlanta was settled in 1836. It became capital of Georgia in 1877.

This city was destroyed by fire in 1864, but was rebuilt on a finer and larger scale and has steadily increased in size and wealth since that time.

The original name of this city was Marthasville and was changed to its present name in 1845.

The Cotton Exposition, held in 1895 in this city, far outranked anything of this character ever held before and in some ways rivalled the World's Fair, $2,000,000 being expended on the buildings, etc.

The city has an excellent system of public schools, as well as a large number of institutions of higher education as listed in The New Practical Reference Library.

QUESTIONS.

In what way does Atlanta differ from most southern cities?

How does this city's location affect her commerce? Of what does the trade principally consist?

What railroads enter this city? How does Atlanta rank among southern cities as a railroad center?

How is this city laid out? What proportion of its streets are paved?

When was this city made the capital? Describe the Capitol building.

What natural advantage has helped the growth of industrial plants in this city?

What are the principal articles manufactured?

At what time was this city almost destroyed? What improvements have been made in its rebuilding?

When and by whom was this city captured during the Civil war?

How does Atlanta compare in population and area with New Orleans, Memphis, Norfolk?

FLORIDA
EVERGLADE STATE
PENSACOLA
TALLAHASSEE
JACKSONVILLE
ST. AUGUSTINE
Ship Canal
PHOSPHATE ROCK
(First)
SPONGE FISHING
(First)
TOBACCO GROWING
CIGAR MAKING
TAMPA
FRUIT RAISING
GRAPES
PINE APPLES
LEMONS
ORANGES
EVERGLADES
GRAPE FRUIT
(First)
KEY WEST

PACKING HOUSE PRODUCTS
LARD
ILLINOIS
"By thy rivers gently flowing,
Illinois, Illinois,
O'er thy prairies verdant growing,
Illinois, Illinois,
Comes an echo on the breeze,
Rustling through the leafy trees,
And its mellow tones are these,
Illinois, Illinois."
HORSES
ELECTRICAL GOODS
APPLES
PEARS
MANUFACTURED ARTICLES
WATCHES
ROCKFORD
ELGIN
AURORA
CHICAGO
COAL
ROCK RIVER
JOLIET
ROCK ISLAND
CHERRIES
GALESBURG
ILLINOIS
"PRAIRIE STATE"
STRAW-BERRIES
PEORIA
ILLINOIS R.
BLOOMINGTON
MISSISSIPPI RIVER
DECATUR
CORN
SPRINGFIELD
AGRICULTURAL IMPLEMENTS
E. ST. LOUIS
BARLEY
WABASH R.
GREAT IN R.R. MILEAGE
CAIRO
OHIO R.
WHEAT & OATS
IRON STEEL
LINCOLN MONUMENT

Illinois

"The Prairie State."

I. Popular Name.
II. Position.
  1. Latitude.
  2. Longitude.
  3. Boundaries.
    (a) Natural.
    (b) Artificial.
III. Outline.
  1. Regular.
  2. Irregular.
IV. Extent.
  1. Definite.
  2. Comparative.
  3. Length and breadth.
  4. Area.
V. Surface.
  1. General character.
    (a) Plains.
    (b) Hills.
    (c) Slope.
VI. Map.
  1. Map study.
  2. Memory sketches.
VII. Drainage.
  1. Lakes.
  2. Canals.
  3. Rivers.
    (a) Systems.
    (b) Principal streams.
    (c) Length.
    (d) Tributaries.
VIII. Climate.
  1. Climatic range.
  2. Causes.
  3. Healthfulness.
  4. Rainfall.
IX. Resources and Industries.
  1. Minerals.
    (a) Building materials.
    (b) Mines.
    (c) Oil wells.
  2. Agriculture.
    (a) Soil.
    (b) Variety of crops.
    (c) Domestic animals.
  3. Manufacturing.
    (a) Articles produced.
    (b) Kind and value.
  4. Meat packing.
  5. Mining.
X. Commerce.
  1. Navigable rivers.
  2. Canals and lakes.
  3. Railways.
  4. Commercial centers.
XI. Education.
  1. Public schools.
    (a) Permanent fund.
    (b) Number of pupils.
    (c) Annual expense.
  2. Higher institutions.
    (a) Universities and colleges.
    (b) Normal schools.
XII. Population.
  1. Total.
  2. Rank.
  3. Increase.
XIII. Cities.
  1. Important ones.
  2. Capital.
  3. Metropolis.
XIV. History.
  1. Settlement.
  2. Indian wars.
  3. Territorial.
  4. Early capitals.
  5. Admission.
  6. Distinguished men.
  7. Later events.

ITEMS OF INTEREST.

The County of Illinois was formed in 1779 with Patrick Henry as first governor.

In 1816 Indians granted a strip of land for the construction of a canal and the Illinois and Michigan Canal was opened in 1848.

The first discovery of coal in America, of which there is any printed account, was made by Father Hennepin in Illinois and was mentioned in Hennepin's Journal in 1698 as being near where Ottawa now stands.

The name "Suckers," which people from Illinois are sometimes called, originated in the early days from the fact that people when traveling in the dry season, when there was no water to be found, by thrusting long hollow reeds into the holes made in the ground by the crawfish, secured a supply of water.

Illinois holds first rank as a producer of corn.
This state stands first among the states in number of horses raised.
The arsenal at Rock Island is the most completely appointed in America.
The Union Stock Yards in Chicago are the largest in the world.
Elgin has one of the largest watch factories in the United States.
The largest zinc works in America are located at La Salle.
Springfield is known as the "Flower City."
Quincy is known as the "Gem City"; Bloomington as the "Evergreen City."
The Illinois Central Railroad was granted by the State a strip of land 7½ miles each side of its track and received every alternate section of land. In return for this the State receives 7% of the railroad's gross earnings.
Illinois ranks second in the production of oats, coal, swine and glass sand.
In value of mineral products, Illinois ranks second.

QUESTIONS ON ILLINOIS.

What is the general outline of this state?
How does its length compare with its width?
What forms its boundaries?
What proportion of the area of Illinois is water?
In what way does the northern part differ from the southern part?
What are the general characteristics of Illinois' climate? What causes the difference in climate?
What is the average rainfall? Where is it heaviest?
What is the most important mineral? Where is it found?
What area of Illinois contains coal? How does it compare with the rest of the state? What is the annual output?
Name other minerals found. In what counties are they found?
Name some important agricultural products.
How does Illinois rank in production of corn?
How does the annual production of corn compare with the annual output of coal?
What percentage of this state's manufactures are produced in its largest city?
What two states exceed Illinois in the extent of their manufacture?
For what are the following cities noted: Chicago, Peoria, Elgin, Moline?
Name three important railroads.
What are some of the important river ports?
Where is the Illinois and Michigan Canal? What does it connect?
What and where is the Drainage Canal? How does it affect Chicago?
What do you know of the livestock of this state?
What is at the head of the school system of the state? From what is the support of the schools derived?
Name some of the Universities in Illinois.
How does the population of Illinois compare with that of New York? Of Mexico?
Name some of the state institutions and where located.
When was Illinois first settled? By whom?
When did the United States acquire this territory?
What part did Illinois play in the Mexican and Civil Wars?
Name some prominent men of Illinois. How were they distinguished?
Name three important events in the history of Illinois since the Civil War.
What are some of the reasons for Illinois' rapid growth?
What are some of its important industries? Where are they conducted?
How does Illinois rank with other states in mining? Agriculture? Meat-packing? Manufacturing?

The following outline is one which a local class can prepare on the industries of their own state.

Illinois

1. Agriculture.
   - Crops raised.
   - Uses.
   - Where raised?
   - Where sent?
2. Stock Raising.
   - Animals raised.
   - Food.
   - Use.
   - Where shipped?
3. Meat Packing.
   - Where carried on?
   - Kinds of animals.
   - Methods of killing.
   - How shipped?
4. Manufacturing.
   - Location of plants.
   - Articles manufactured.
   - Uses.
   - Where shipped?
5. Mining.
   - Where carried on?
   - Minerals mined.
   - Quantities.
   - Use.

Chicago

"The Garden City."

- Description.
  - Location.
  - Population.
  - Size.
  - Divisions.
  - Business district.
  - Residence portions.
  - Streets.
    - Direction.
    - Regularity.
- Waters.
  - River.
    - Location.
    - Direction of flow.
    - Branches.
  - Lake Michigan.
    - Water supply.
    - Tunnels.
    - Cribs.
  - Chicago Drainage Canal.
- Parks and Boulevards.
  - Park system.
    - Management.
  - Largest parks.
    - Lincoln.
    - Jackson.
  - Boulevards.
    - Completeness.
    - Extent.
    - Important ones.
- Transportation.
  - Electric.
  - Elevated.
  - Steam
  - Mileage.
- Commerce.
  - Extent.
  - Value.
  - Lake traffic.
  - Inland port.
  - Commercial center.
  - Railroad center.
- Industry.
  - Industrial center.
  - Live stock market.
    - Slaughtering.
    - Meatpacking.
  - Manufacturing.
    - Number.
    - Foundries.
    - Agricultural implements.
  - Stores.
    - Wholesale.
    - Retail.
    - Extent.
    - Importance.
- Prominent Buildings.
  - Federal building.
  - County building.

City hall.
Libraries.
Number.
Size.
Art Institute.
Theaters.
Churches.
Field Museum.
Board of Trade.
EDUCATION.
Number of schools.
System.
Universities.
Institutes.
Settlement houses.
Schools of art and music.
HISTORY.
Early settlers.
Fort Dearborn.
Great Fire.
Later events.
Progress.
Growth.

ITEMS OF INTEREST.

The boulevard system of Chicago is noted for its extent and completeness.
The library of the University of Chicago is the most valuable in the city.
Chicago is the industrial and commercial center of the west.
It is the greatest railroad center and live stock market in the world.
The stock yards contain the largest meat-packing houses in the world.
Chicago is noted for its immense retail stores, Marshall Field & Co.'s store being the largest in the world.
Chicago ranks second in the United States in extent and value of its commerce.
No other large city in the world has increased in population and wealth as rapidly as Chicago.
Chicago is the greatest grain market in the world.
In size and population this city ranks second in the United States.

QUESTIONS.

How does Chicago compare in size and population with London? Paris? New York?

What causes the divisions in this city and what are the divisions called?

How does the mileage of the surface lines compare with that of the elevated roads?

What percentage of the total population of this city travels daily over its transportation lines?

How does the drainage canal affect the drainage of Chicago?

From where is the water supply obtained? How is it procured?

How does Chicago's location favor its manufactures?

How many workmen are employed in its factories?

What is the most important industry? Where is it carried on?

How does Chicago rank in extent and value of its commerce?

When was Chicago first visited? By whom?

What well-known fort was erected at Chicago? In what year? When was it evacuated? Why?

What great disaster occurred in this city in 1871? What was the loss?

Name three important events which have taken place in Chicago since the great fire.

What progress has been made in late years?

Indiana

"The Hoosier State."

Location.
- Position.
- Boundaries.

Surface.
- Divisions.
- Characteristics.
- Hills.
- Plains.
- Marshes.
- Caves.

Climate.
- Difference.
- Cause.
- Rainfall.
- Snowfall.

Resources.
- Fertile soil.
- Natural gas.
- Bituminous coal.
- Oil fields.
- Clays.
- Limestone.

Rivers.
- Systems.
- Principal ones.
- Areas drained.
- Underground streams.

Cities.
- Capital.
- Trade centers.

Agriculture.
- Grains.
- Fruits.
- Grazing.

Manufacturing.
- Factories.
- Foundries.
- Mills.
- Distilleries.
- Quarries.

History.
- Explorers.
- Settlement.
- Territorial.
- Admission.
- Progress.

INTERESTING ITEMS.

The Epsom Salt Cave in Indiana contains Epsom salt, sometimes in lumps of ten pounds weight, which entirely covers the floor of the cave.

The Lost River in Orange County runs underground for a distance of eleven miles.

The glass works in New Albany are the largest of the kind in America.

Richmond is called the "Quaker City of the West."

On the Kankakee River are extensive cranberry marshes.

Michigan City is the only lake port in Indiana.

The first settlement in Indiana was made at Vincennes in 1702.

Delphi is noted for its lime manufactures.

Indiana excels all other states in the manufacture of plate glass.

Indianapolis is the largest city in the United States not situated on navigable water.

Hamer's Cave is about two miles east of Mitchell, and the floor is covered with a swift stream of water varying in depth from eight inches to about twenty feet. Few people explore this cave, as a boat must be used to do so.

Indiana is noted for the number of literary people which it has produced.

QUESTIONS ON INDIANA.

What is the general outline of this state?

How does its area compare with that of New Mexico? Colorado?

How is the surface divided? How does the surface vary in these regions?

In what region are the underground streams found?

What and where is Wyandotte Cave?

What is meant by "Dunes"? Where are they found?

What are some of the principal rivers? What territory does each drain?

What causes the difference in temperature?

Where is the heaviest snowfall? Where the heaviest rainfall?

Where are the coal fields situated? What kind and of what use is the coal?

Where is the natural gas field? What area does it cover?

In what part of the state is the oil field?

What building materials are found?

What is the leading industry?

What are the chief crops raised?
What natural facilities have aided Indiana in its manufactures?
What are some of the most important manufactures?
What railroad facilities has this state? What is its mileage?
What rivers afford transportation?
Name some of the most important cities.
When was the first permanent white settlement made? Where?
To what countries did Indiana belong?
When and how did it become a possession of the United States?
What other states were included in the territory of this state? When was it reduced to its present size?
How long has Indiana been a state?
What progress has it made?

Iowa

"The Hawkeye State."

Location.
- Latitude.
- Longitude.
- Position.

Boundaries.
- Natural.
- Artificial.

Outline.
- Regular.

Extent.
- Length.
- Breadth.
- Area.
- Comparative.

Population.
- Total.
- Square mile.
- Comparative.

Surface.
- Prairie.
- Swells.
- Valleys.
- Slopes.
- Altitudes.
- Hills.

Drainage.
- Rivers.
  - Systems.
  - Largest.
- Lakes.
  - Names.
  - Beauty.

Climate.
- Varieties.
- Characteristics.
- Snowfall.
- Atmosphere.
- Healthfulness.
- Rainfall.

Mineral Resources.
- Products.
- Quality.
- Supply.

Agriculture.
- Per cent of farms.
- Products.
  - Cereals.
  - Grasses.
  - Fruits.
  - Stock.
  - Dairy.

Manufacturing.
- Extent.
- Kinds.

Transportation.
- Waters.
- Railroads.

Commerce.
- Extent.
- Imports.
- Exports.

Education.
- Illiteracy.
- Public schools.
- Higher institutions.

Eleemosynary Institutions.
- Names.
- Locations.

Cities.
- Names.
- Characteristics.
- Unique feature.

HISTORY.

Original inhabitants.
Marquette and Joliet.
First settlement.
Louisiana Purchase.
Territorial organization.
Admission.
Prominent questions.
Advanced legislation.

ITEMS OF INTEREST.

Iowa is a leading agricultural state in the Union.

Dubuque, which is the oldest town in the state, is known as the "Key City."

Iowa produces more oats than any other state.

On the Iowa River, near Decorah, is a natural ice cave which contains a cavern the interior of which is a mass of ice. This cave was used in early times by the Indians for preserving game.

Iowa ranks twenty-second in size.

This state is second only to New York in number of milch cows.

The highest point of land in this state is located near Spirit lake.

Iowa is the only state having an entire eastern and western river boundary.

In Wright County is found a curious lake which is entirely surrounded by a wall of stone six feet high and varying in width from five to fifteen feet. No one knows where the water comes from and where it goes as the land adjoining is lower than the water. It is called, on this account, the "Walled Lake."

Iowa produces almost twice the number of hogs produced by any other state.

TEST QUESTIONS ON IOWA.

What is Iowa's position in the United States?

What is the general outline? How does the outline of the eastern boundary differ from the western?

What parts of its boundaries are formed by water?

How does its length compare with its width?

How does Iowa compare in size with Texas?

What other states are in the same latitude?

What are the general characteristics of the surface?

Where is the highest altitude? Where the lowest?

What proportion of the state is drained into the Mississippi?

In what part of the state is the Des Moines river?

What rivers water that part of the state drained into the Missouri?

Where is the lake region? For what are the lakes noted?

What is the extreme difference in temperature? Where is snowfall heaviest?

What minerals are obtained in this state? Where are they found?

How do they rank in value? For what are they used?

What percentage of the surface is devoted to agriculture?

How does Iowa rank in agriculture?

What is the principal crop raised? Where is it raised principally?

What is the annual crop of corn? Does any other state grow more corn?

Name another important agricultural industry. How is it especially adapted?

What other state exceeds Iowa in number of cattle?

Name some manufactures. Are they important?

What railroad facilities has Iowa? What navigable streams?

What is the percentage of illiteracy found in this state?

From what has the school fund been obtained?

Name six important cities. How are they important?

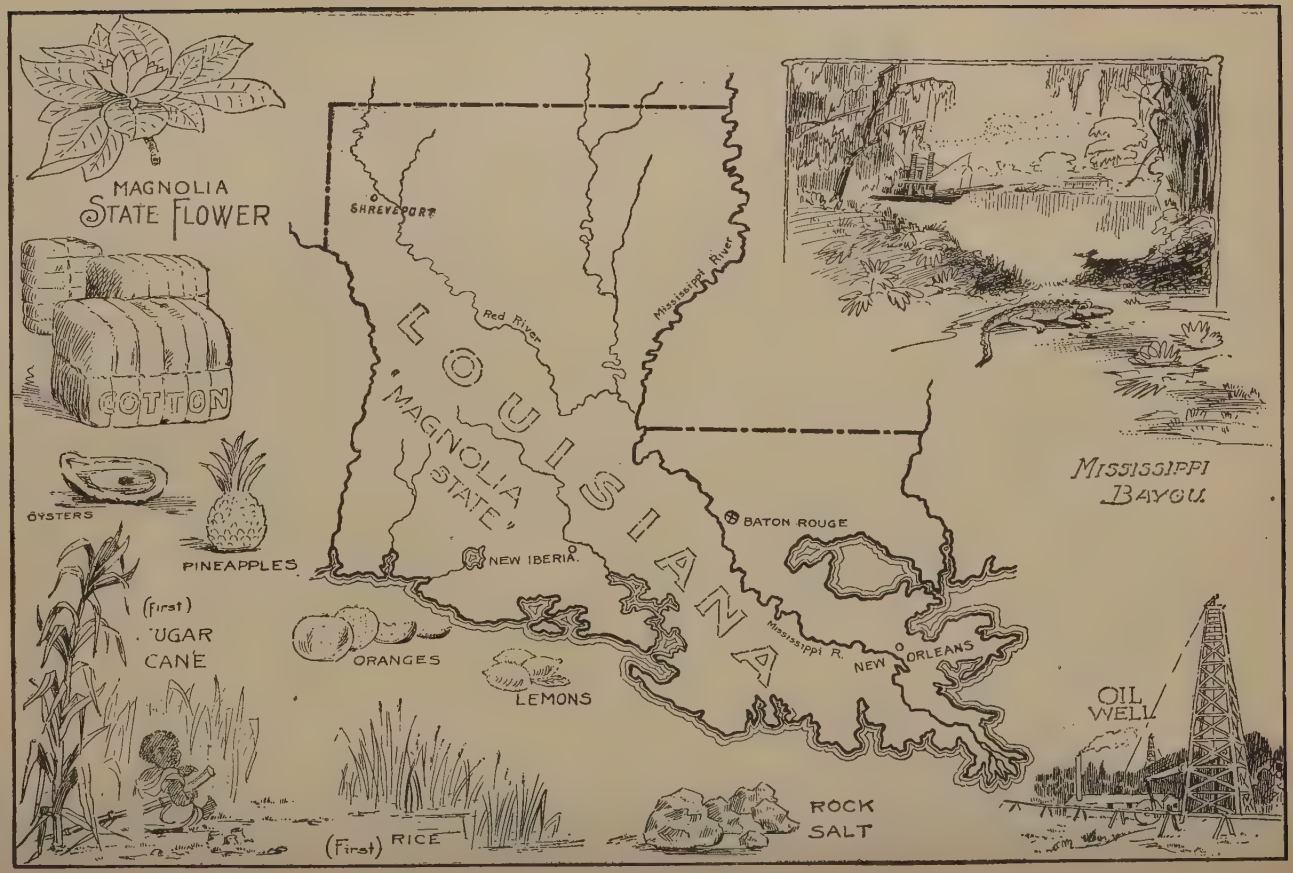
Who were the original inhabitants?

Name three explorers.

When and how did the United States gain possession?

To what territories did Iowa belong?

When was it admitted to the Union?


MAGNOLIA
STATE FLOWER
COTTON
OYSTERS
PINEAPPLES
(first)
SUGAR
CANE
ORANGES
LEMONS
(First) RICE
ROCK
SALT
OIL
WELL
SHREVEPORT
Red River
Mississippi River
LOUISIANA
"MAGNOLIA
STATE"
BATON ROUGE
NEW IBERIA
Mississippi R.
NEW ORLEANS
MISSISSIPPI
BAYOU

Massachusetts

"Old Bay State."

I. Position.
- Latitude.
- Longitude.
- Relative.
- Comparative.

II. Boundaries.
- Natural.
- Artificial.

III. Coast Line.
- Character.
- Extent.
- Capes.
- Bays.

IV. Surface.
- Divisions.
- Mountains.
- Lowlands.
- Hills.
- Valleys.
- Islands.

V. Waters.
- Rivers.
- Channels
- Lakes.
- Ocean.

VI. Climate.
- Temperature.
- Variations.
- Ocean winds.
- Rainfall.

VII. Resources.
- Minerals.
  - a. Kinds.
  - b. Extent.
  - c. Value.
- Fisheries.
  - a. Varieties.
  - b. Quantity.
  - c. Catching.
  - d. Curing.

VIII. Agriculture.
- Extent.
- Localities.
- Crops.
- Fruits.
- Dairy products.

IX. Manufacturing.
- Facilities.
- Extent.
- Articles.
- Importance.

X. Commerce and Transportation.
- Navigable rivers.
- Railroads.
- Electric lines.
- Foreign.
- Domestic.

XI. Population.
- Present.
- Comparative.
- Square mile.

XII. Cities.
- Capital.
- Seaports.
- Railroad centers.
- Manufacturing centers.
- Size.
- Importance.

XIII. Education.
- Schools.
- Efficiency.
- Established.
- Universities.
- Colleges.

XIV. History.
- Explorers.
- Settlement.
- Colony.
- Early leaders.
- Witchcraft.
- Development.
- Boston Tea Party.
- Revolutionary war.
- Shay's rebellion.
- State constitution.
- Civil war.
- Progress.
- Literary prominence.

ITEMS OF INTEREST.

Massachusetts ranks first in granite, emery and cod fisheries.
First in production of cotton and woolen goods, boots and shoes.
First in manufacture of paper from wood pulp.
The first free school and college in the United States was established in this state.
Massachusetts contains a greater number of large cities than any other state.
The Hoosac Tunnel is the longest railroad tunnel in the United States.
The first line of railroad was opened at Quincy, in 1827.

Holyoke is called the "Paper City."

Quincy is called the "Granite City."

Worcester, because of its many schools, is sometimes called the "Academic City."

Worcester is also known as the "Heart of the Commonwealth" on account of its position and influence in political affairs.

Southbridge has the largest spectacle factory in the world.

The lowlands of Cape Cod are noted for their cranberries.

The first cotton mills in America were established at Beverly.

Cambridge contains Harvard, the oldest and richest college in America.

Worcester has the largest wire mills in the world.

The paper on which the United States money is printed is manufactured at Dalton.

Waltham contains the largest watch factory in the world.

Lynn is noted for its boots and shoes.

Lowell is called the "City of Spindles" and manufactures more cotton goods than any other place in the world.

Near Stockbridge is found an ice hole which contains ice the year around. This is caused by such great accumulations of snow that ice remains throughout the summer.

Gloucester is the largest fishing port in the country.

New Bedford is the first seaport in the world in extent of whale fisheries.

QUESTIONS ON MASSACHUSETTS.

What other states are in the same degree of latitude? Longitude?

To what group of states does Massachusetts belong? Why are they so called?

How does Massachusetts compare in size with Texas? California?

What other states have a smaller area?

What is the character of the coast line? How does this affect her commerce?

Name three important bays. What important cities are located on them?

How does the surface of the western part differ from the eastern?

Name two large islands which are included in the boundaries of Massachusetts.

What is the character of the soil? What effect does this have on the agriculture?

To what mountain range do the Berkshire Hills belong? For what is this part of the state noted?

What river divides this state?

What is characteristic of the rivers in Massachusetts? What is the cause?

How does the climate of the coast differ from that of the interior? Of the western boundary? What causes this difference?

In the production of what minerals does Massachusetts lead?

What fish are principally caught? Where are the oyster beds?

Where and how are cod fish caught?

What fruit does Massachusetts raise in abundance? Where is it raised?

What branch of agriculture is principally followed? Why?

What is the leading industry? How does this state compare in the extent of its manufactures?

Name five articles in the manufacture of which Massachusetts leads.

Locate and describe the Hoosac tunnel.

How does the population of Massachusetts compare with that of Texas? What is the population to the square mile?

Name and locate six manufacturing centers in Massachusetts and tell what each is noted for.

For what is Plymouth celebrated? Concord? Lexington?

What is the capital of this state? For what is it noted?

What is the reason for this state's extensive commerce?

Name some exports that pass through Boston. Some imports.
What is noteworthy of the schools of this state?
When and where was the first university founded in America?
Who first explored the coast of Massachusetts?
How many years elapsed before the first permanent settlement?
What is said of the Pilgrims? Name some early leaders.
What is said about witchcraft?
What important events at the beginning of the Revolutionary war took place in Massachusetts?
When was the first state constitution adopted? What did it abolish?
What was the cause of Shay's rebellion?
What political party did Massachusetts favor at first? When did it change?
For what was John A. Andrew conspicuous?
How has this state been prominent?
What six places in Massachusetts do you think would be the most interesting to visit? Why?

Boston

"The Hub of the Universe."

- History.
  - First settlement.
  - Early leaders.
  - Revolutionary war.
  - Anti-slavery movement.
  - Later events.
  - Progress.
- Description.
  - Location.
  - Area.
  - Population.
  - Direction of streets.
  - Business district.
  - Residence portion.
  - Boulevards.
    - Massachusetts avenue.
    - Commonwealth avenue.
    - Strandway.
    - Fenway.
  - Parks.
    - Boston Common.
    - Public Gardens.
  - Monuments.
    - Soldiers and Sailors.
    - Shaw's Memorial.
    - Washington.
    - Everett.
    - Sumner.
- Commerce and Industry.
  - Extent.
  - Harbor.
  - Imports.
  - Exports.
  - Manufactures.
- Transportation.
  - Steam.
  - Electric.
  - Elevated.
  - Subway.
- Public Buildings.
  - Statehouse.
  - City hall.
  - Federal building.
  - Court house.
  - South station.
  - Churches.
  - Hotels.
  - Schools.
  - Institutes.
- Culture.
  - Music.
    - Symphony Orchestra.
    - Symphony Hall.
    - Schools of music.
  - Art.
    - Museum of Fine Arts.
    - Art schools.
    - Theaters.
- Historical Features.
  - Old statehouse.
  - Old South Meeting House.
  - Christ Church.
  - King's chapel.
  - Faneuil Hall.
  - Old burying grounds.

INTERESTING ITEMS.

Boston is the largest market in the world for leather goods.
This city is sometimes called the "Athens of America."
The largest circulating library in the world is located in Boston.
Boston Common is the oldest public park in America.
In foreign commerce Boston ranks second in the United States.
Boston is the commercial center of the New England states.
The statue of Washington, which stands at the entrance of the Public Gardens, is considered one of the six great equestrian statues in the world.
The South railway passenger station in Boston is said to be the largest in the world.

TEST QUESTIONS ON BOSTON.

Which has the larger population, Boston or St. Louis? Boston or Baltimore?
What famous university is within a few minutes' ride of the city?
What is peculiar about the way Boston is laid out?
From what point do the streets radiate?
Which streets are the important business thoroughfares?
Which street is the great financial center of the city?
How many miles of streets are paved?
For what is Charleston noted? What is interesting about Roxbury?
How are the numerous sub-divisions of Boston connected?
Why is such great interest attached to the *Common?*
What historic associations has it? How many acres does it cover?
How long has it been used as a pleasure ground? What noted monuments are in the Common?
What event in history does the Soldiers' and Sailors' monument commemorate?
What noted statues are in the Public Garden?
Which is the most important of the historic structures?
When was the old State House built? What use has it served? What historic *scenes* were enacted within this building?
When was King's Chapel established? How does it figure in history?
Why is Faneuil Hall known as the Cradle of Liberty?
What distinguishes the Boston Theater?
What theaters are worthy of mention?
Why is the Boston Public Library considered one of the finest buildings in the country?

(a)
(b)
(c)

How many volumes does it contain?
What school in Boston is the most noted of its kind in the country?
What place does Boston occupy as a commercial and financial center?
In this respect how does it compare with New York?
What natural advantages has it for foreign commerce?
What other interests are centered here?
When was the first settlement on the peninsula made and by whom?
When was the first meeting house erected? The first school building?
What part did Boston take in the events which led to American independence?

History Topics (look up):

(a) Boston Massacre
(b) Boston Tea Party
(c) Battle of Lexington
(d) Battle of Bunker Hill

Name ten noted writers who have lived in Boston.

Michigan

"The Lake State."

"Wolverine State."

I. Situation.
- Relative.
- Boundaries.
- Position.

II. Size.
- Area.
- Length.
- Breadth.
- Shape.

III. Coast Line.
- Extent.
- Regular.
- Irregular.
- Bays.
- Peninsulas.

IV. Surface.
- Divisions.
- Undulating.
- Level.
- Mountainous.

V. Waters.
- Rivers.
- Falls.
- Lakes.

VI. Climate.
- Variations.
- Causes.
- Rainfall.

VII. Minerals.
- Varieties.
- Value.
- Usefulness.

VIII. Industries.
1. Agriculture.
   - Unique feature.
   - Soil.
   - Crops.
   - Fruits.
   - Peppermint.
   - Live stock.
2. Manufacturing.
3. Lumbering.
4. Fishing.

IX. Commerce.
- Water routes.
- Railroads.
- Exports.
- Imports.

X. Cities.
- Important ones.
- Lake ports.
- Manufacturing centers.

XI. Education.
- Public schools.
- Normal schools.
- State university.

XII. History.
- Early missionaries.
- Pontiac's war.
- Territorial.
- War of 1812.
- Admission.

ITEMS OF INTEREST.

Michigan has a larger coast line than any other state.

The state normal school of Michigan was the first one established west of New York.

Michigan leads the world in the production of peppermint.

First state in production of salt and second in beet sugar.

Michigan has the greatest facilities for water transportation of any state.

Michigan is an Indian name meaning "A river for fish."

Detroit is known as the "Gibraltar of the Lakes."

Peat deposits are found in the northern peninsula of Michigan.

Michigan is called the "Peninsula State" and the motto of the state is "If thou seekest a beautiful peninsula, look around."

Michigan produces 38 per cent of the salt obtained in the United States.

Battle Creek contains the largest medical sanitarium in the world.

Kalamazoo is noted for its celery.

Detroit has the best harbor of any city on the Great Lakes and is the largest center in the world for stoves, railroad cars and emery wheels.

Michigan ranks second in iron ore and third in copper.

QUESTIONS ON MICHIGAN.

In what latitude is Michigan? What effect does this have on the climate? What other countries are in the same latitude?

What is the general shape of this state? How is it divided? What are the divisions called?

How do the boundaries of Michigan differ from other states?

Name some important bays. On what bodies of water are they situated?

How does Michigan's position affect her commerce?

For what are the small lakes noted? How many more lakes than islands?

Why is the temperature on the western coast milder than ten miles inland?

How does Michigan rank in production of minerals?

Name four important minerals. Where found?
What other states produce more copper? More iron?
What process is used to obtain salt?
What part of this state is adapted to agriculture? What part to fruit?
What is the most important fruit raised? What is the annual crop?
What is a peculiarity in the agriculture of this state?
What industry is associated with Grand Rapids? Kalamazoo?
How does Michigan compare in tonnage of ships with other coast states?
What are some of the principal exports?
In what year was Michigan first visited? By whom?
How many years elapsed before the first permanent settlement?
How did the United States gain possession?
To what territory did Michigan originally belong? When did it become a separate territory?
What delayed its admission into the Union?
What two issues have been important in this state's politics?
From what does Michigan take its name? What does it mean?
What is the state motto?

Minnesota

"The Gopher State."
"The North Star State."

I. Situation.
- To what group of states does Minnesota belong?
- What is its relative position in the United States?
- What approximate proportion of its boundaries are made up of water?
- Compare its position with that of Ontario.
- Which extends farthest north, Minnesota or Maine?

II. Size.
- What other states are larger than Minnesota?
- How does the length of Minnesota compare with the width of Texas?
- How many times will Minnesota contain a state the size of Massachusetts?

III. Surface.
- Describe the general character of the land.
- Where is the highest and where the lowest altitude?
- What proportion of its area is composed of water?
- Where is the height of land located? What purpose does it serve?

IV. Drainage.
- How many river systems in Minnesota? What territory does each system drain?
- How does the water of the lakes on the north finally reach Hudson Bay?
- Where is the lake region? How many lakes has Minnesota?
- What and where is the water shed in this state?

V. Climate.
- Why are changes in temperature in this state less noticeable than in Illinois?
- What are the characteristics of the four seasons in Minnesota?

GRAIN ELEVATORS
FLOUR MILLS
MINNEAPOLIS
ST. PAUL
LAKE OF THE WOODS
RAINY LAKE
ARCTIC-ST. LAWRENCE WATERSHED
ARCTIC-GULF WATERSHED
ST. LAWRENCE-GULF WATERSHED
DULUTH
MOORHEAD
MINNESOTA
Mississippi River
ST. CLOUD
ST. PAUL
MINNEAPOLIS
Minnesota River
MANKATO
WINONA
LUMBER
HAY
MINERAL WATER
(first)
WHEAT
first — Winter Wheat
MOCCASIN FLOWER
STATE FLOWER
OATS
RYE
CORN
APPLES
LIME STONE
IRON ORE
(First)
PIPE STONE
ICE PALACE
A former characteristic
GRANITE
PROMINENT MEN
WM. WINDOM
GOV SIBLEY
JOHN S. PILLSBURY
LUCIUS HUBBARD
WM. R MERRIAM
GOV JOHNSON
CUSHMAN K. DAVIS
FRANK B. KELLOGG

VI. NATURAL RESOURCES.

What is the most important mineral found in Minnesota? Where is it found?

How is iron ore smelted?

VII. POPULATION.

What is the average population to the square mile?

What would be the approximate population if as thickly settled as Rhode Island?

What part of the state is practically unsettled?

VIII. LEADING INDUSTRIES.

Name the five most important industries.

In what way do they differ from the industries of Indiana?

What are some of the crops raised? What part is best adapted to the cultivation of wheat?

To what does Minnesota owe the rapid development of her industries? Why?

IX. COMMERCE AND CITIES.

What are some of the various means of transportation in this state?

What products are exported? What are imported?

What are the leading manufacturing centers?

Name some important lumber centers.

For what is Minneapolis noted? St. Paul? Duluth?

On what bodies of water would a cargo of wheat travel in going from Duluth to New York?

X. HISTORY.

What retarded its growth? How was it overcome?

Name the most important issue since the Civil war? How was it settled?

How did the state get its name? What is its meaning?

XI. EDUCATION.

In what way does the educational system differ from Illinois?

Name some of the important institutions of learning.

XII. GOVERNMENT.

Is the legislative department different from that of Pennsylvania? In what respect?

What officials constitute the executive department? What are their terms of office?

To what branch of the government do the supreme and district courts belong?

What is the state motto? Why is it appropriate?

ITEMS OF INTEREST.

St. Paul and Minneapolis are sometimes called the "Twin Cities."

Duluth is known as the "Zenith City" and the "Gateway of the East."

St. Anthony's Falls affords water power for over twenty-four flour mills.

Red River of the North is said to be the straightest river of its size in the United States.

Minnesota is an Indian name meaning "Sky tinted water."

The state motto is "The Star of the North."

Both Mississippi River and Great Lakes navigation begin in Minnesota.

Minneapolis is sometimes called the "Sawdust City" on account of the large number of saw mills.

The magnetic iron ore found near Vermillion Lake is the purest found anywhere.

The Pipestone Quarry near Pipestone, Minn., is the only one of its kind in the world. The stone is soft when first quarried and hardens rapidly after being exposed to the air.

Minnesota ranks first in production of spring wheat and mineral waters.

Produces nearly one-half of the iron ore in the United States.

"Twin Cities"

MINNEAPOLIS.	ST. PAUL.
SITUATION.	LOCATION.
SIZE.	TERRACES.
DIVISIONS.	DIVISIONS.
PLACES OF INTEREST.	PLACES OF INTEREST.
Lake Calhoun.	Como park.
Lake Harriet.	Phalen park.
Minnehaha falls.	Indian Mound park.
Riverside park.	Fort Snelling.
Falls of St. Anthony.	Agricultural College.
Mississippi river.	Capitol building.
Univ sity of Minnesota.	COMMERCE AND INDUSTRY.
INDUSTRY.	Favorable situation.
Manufacturing center.	Railway center.
Commercial center.	Transshipping.
Flour mills.	Wholesale trade.
Saw mills.	Manufactures.
Wheat market.	Industrial plants.
Mercantile business.	Meat packing.
HISTORY.	Electric car system.
Settlement.	HISTORY.
Cause of growth.	Origin of name.
Incorporation.	Growth.

INTERESTING FACTS.

St. Paul is located on several terraces on the left bank of the Mississippi river, 2,200 miles north of its mouth.

Steamboat navigation for large boats starts at St. Paul.

Mississippi river steamboat navigation for large boats starts at St. Paul.

Minneapolis manufactures more flour than any other city in the United States.

Water power for its many mills and factories is obtained from the Falls of St. Anthony.

Pillsbury's A mill has a capacity of 7,000 barrels daily and is the largest of its kind in the world.

The manufacture of lumber is also an important industry in Minneapolis, the saw mills turning out over half of the lumber produced in Minnesota.

QUESTIONS.

MINNEAPOLIS.

How does the area of Minneapolis compare with that of St. Paul?

In what part of the city are the Falls of St. Anthony?

What great industrial establishments center around these falls?

For what is Minnehaha park noted?

What is the most important industry of Minneapolis? What other industry does this occasion? What industry ranks second in importance?

What is meant by a primary wheat market? Name the most important one.

ST. PAUL.

What is visible from all points in St. Paul? Why is this possible?

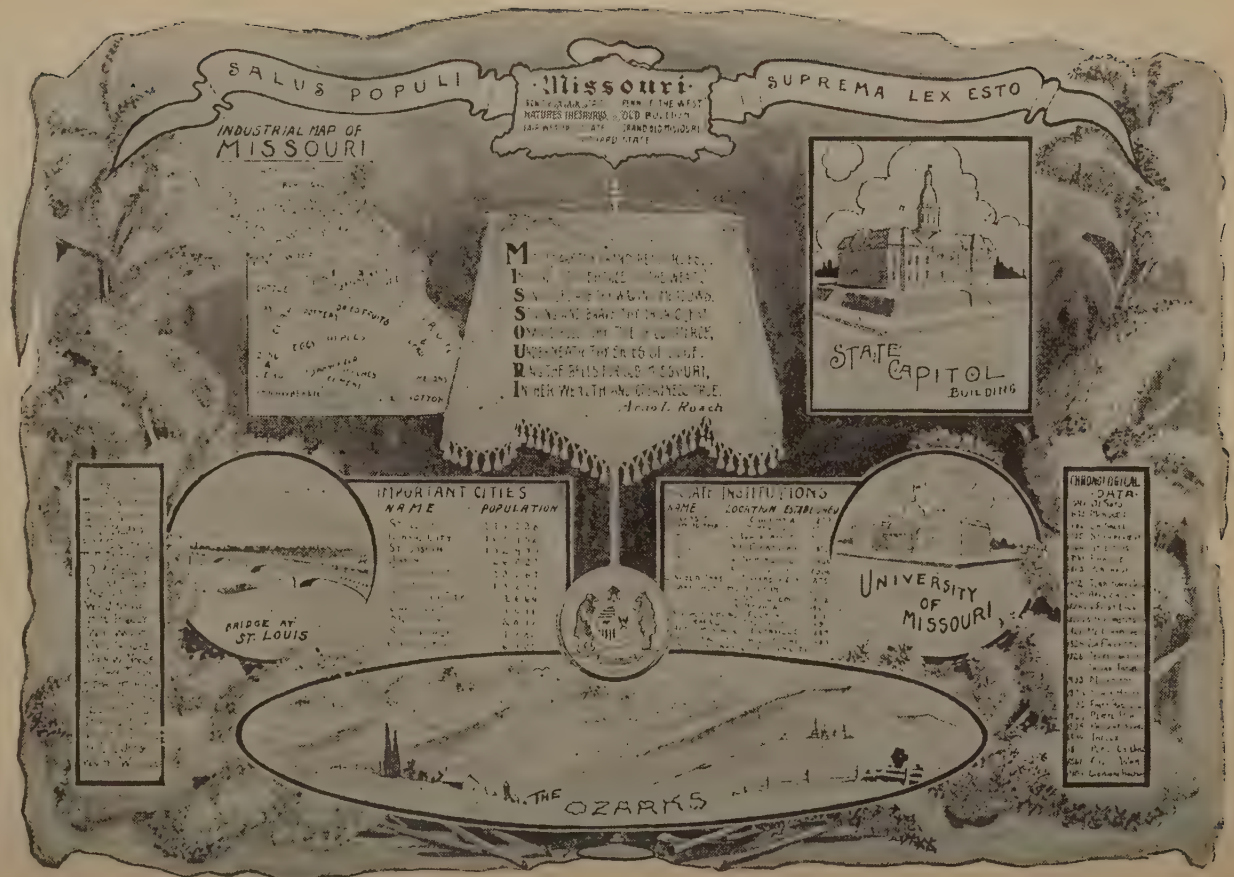
How is this city laid out? What characterizes each division?

How has St. Paul's location affected her commerce? Of what is it the center?

What is meant by "transshipment"? To what extent is it carried on in this city?

What was the original name for this city? When and how did it get its present name?

What has been an unusual feature of its history?


SALUS POPULI
Missouri
SUPREMA LEX ESTO
INDUSTRIAL MAP OF
MISSOURI
STATE CAPITOL
BUILDING
IMPORTANT CITIES
NAME
POPULATION
STATE INSTITUTIONS
NAME
LOCATION
ESTABLISHED
CHRONOLOGICAL
DATA
BRIDGE AT
ST. LOUIS
UNIVERSITY
OF
MISSOURI
THE OZARKS

Missouri

"Iron Mountain State."

- Location.
  - Latitude.
  - Longitude.
  - Position in United States.
- Boundaries.
  - Natural.
  - Political.
- Extent.
  - Length.
  - Breadth.
  - Area.
    - Total.
    - Comparative.
- Population.
  - Present.
  - Comparative.
- Surface.
  - Diversity.
  - Slope.
  - Grand Divide.
  - Mountains.
  - Prairies.
  - Swamps.
- Climate.
  - Characteristics.
  - Variation.
  - Seasons.
  - Winds.
  - Rainfall.
- Natural Resources.
  - Soil.
  - Mineral wealth.
  - Forests.
  - Water power.
  - Navigation.
- Industries.
  - Agriculture.
    - Extent.
    - Variety.
    - Farming.
    - Stock raising.
  - Mining.
    - Minerals.
    - Location.
    - Value.
    - Use.
- Industries.—Cont.
  - Manufacturing.
    - Variety.
    - Rank.
    - Articles.
  - Lumbering.
    - Kinds.
    - Value.
  - Quarrying.
    - Localities.
    - Extent.
  - Commerce.
    - Facilities.
    - Amount.
    - River traffic.
    - Railroads.
- Productions.
  - Agricultural.
    - Live stock.
    - Cereals.
    - Vegetables.
    - Fruits.
  - Mineral.
    - Iron.
    - Coal.
    - Zinc.
    - Clays.
    - Building stones.
    - Glass sand.
    - Nickel.
- Education.
  - School System.
  - Higher Institutions.
  - Universities and colleges.
- History.
  - Explorers.
  - Treaty of Paris.
  - Louisiana Purchase.
  - Missouri Compromise.
  - First railroad.
  - Civil war.
  - Later events.

INTERESTING ITEMS.

Missouri ranks first in the production of lead and zinc; second in mules, and third in corn.

In point of size and richness, the broad alluvial valleys of this state stand unsurpassed.

The climate of this state can be easily judged from the fact that it is known as "The Fair Weather State," and "The Italy of the Mississippi Valley."

Missouri shares in the navigation of the two greatest rivers in the United States.

This state is not excelled by any other state in the variety of its products.
Missouri produces the largest number of watermelons among the states.
Kansas City is the second live stock market in the United States.
Jefferson City has been the capital of Missouri since 1826 and is located on the south bank of the Missouri river, near the center of the state.
Over one-half of the total zinc produced in the United States comes from near Joplin.
Missouri ranks fifth in population.
The largest electric light plant in the world is located at Grand Falls.
The oldest town in the state is St. Genevieve.
The state motto is: "Let the welfare of the people be the supreme law."

QUESTIONS.

Into what sections is this state divided? What has caused the division?

How is the southern portion of the state divided? What are the characteristics of each section?

What can you tell of the diversity of surface in this state?

What other states are larger than Missouri? What percentage of its area is composed of water?

What two great rivers form a part of its boundaries? Name and locate some of their tributaries.

Does this state's situation affect her climate? In what way? How does the northern part differ from the southern?

What mineral products are found in this state? In the production of what minerals does this state lead?

How does Missouri's position and climate affect her agriculture? How do the products raised in various parts of the state differ?

What crops are raised in the northern and western parts of the state? The central? The southern?

What animals are raised? What industry has this developed in some of the cities?

How do the manufactures of this state compare with other states west of the Mississippi?

Name four important industries and the cities where they are carried on most extensively.

What advantages has this state for commerce? What articles are exported? What imported?

What part of the state has the best railroad facilities? How does its mileage compare with that of Illinois? Indiana?

In what way do the industrial interests of Joplin differ from those of Kansas City? What are the principal industries of St. Louis?

What noted Spanish explorer visited this state? In what year?

What connection did the Treaty of Paris have with this state?

By what means was it secured by the United States? In what year?

What was the Missouri Compromise? When was this state finally admitted to the Union?

What position did it take in the Civil war?

Describe the progress this state has made in late years. What rank does it now hold among the other states in the Union?

St. Louis

"The Mound City."

HISTORY.
- Trading post.
- Spanish territory.
- French territory.
- Louisiana territory.
- Incorporation.
- Missouri territory.
- Capital of state.
- Growth.
- Present population.

DESCRIPTION.
- Situation.

- In state.
- In United States.
- On river.
- Area.
- Population.
- Rank.

PARKS.

- Area.
- Forest park.
  - Size.
  - Description.
- Shaw's Gardens.
  - Fame.
  - Beauty.
  - Size.
- Other parks.

BUILDINGS.

- Characteristics.
- Public buildings.
- Historic buildings.
- Office buildings.
- Churches.
- Hotels.
- Charitable Institutions.

EDUCATION.

- School system.
- Libraries.
- Universities.

INDUSTRIES.

- Wholesale trade.
- Manufacturing center.
- Output of factories.
- Articles manufactured.

COMMERCE.

- Railroads.
  - Number.
  - Tunnels.
  - Cupples' station.
  - Union station.
- Distributing point.
- River traffic.
- Ead's Bridge.
- Merchants' Bridge.

ITEMS OF INTEREST.

The largest hardware and drug houses in America are found in this city.

St. Louis contains the largest brewery in the world, the interior of which is like a small city.

Commerce and manufacturing are its chief industrial interests.

St. Louis is an important railroad center, and its Union passenger station is considered one of the finest in America.

St. Louis ranks first in trade in mules and horses and second in the manufacture of flour.

St. Louis manufactures the largest number of street cars in the world.

It is the largest city west of the Mississippi river and is the commercial metropolis of the Mississippi valley.

Shaw's Botanical Gardens, in this city, are said to be the finest in the world.

St. Louis has developed rapidly in size and wealth, and in the last ten years has put up over 26,000 new buildings.

QUESTIONS.

What other cities in the United States have a larger population than St. Louis?

What proportion of the total area covered by parks is contained in Forest park? For what was the western half of this park used?

What famous gardens are located in this city? For what are they noted?

What is characteristic of the buildings of this city?

Name and describe three important public buildings in this city.

How was the public library obtained? How many volumes does it contain?

For what section of the country is St. Louis a distributing point?

How does this city rank in transshipment of goods?

What is the Cupples' station? What amount of freight can be handled in twenty-four hours?

What is the value of the annual factory outputs?

Of what do its manufactured products consist?

For whom was this city named?

To what different countries did it belong?

What progress has it made in growth and wealth?

NEBRASKA
"ANTELOPE STATE"
MEAT PRODUCTS
LARD
CORN BEEF
Sand Hills
Salt Lakes
Missouri River
GOLDENROD STATE FLOWER
FREMONT
OMAHA
HOGS
LINCOLN
NEBRASKA CITY
River Platte
HASTINGS
BEATRICE
FLOUR
CORN
WHEAT
OATS
RYE
SUGAR BEETS

Nebraska

"Tree Planter State."

I. Situation.
- What is the relative position of Nebraska in the United States?
- What is the difference in latitude between Nebraska and Georgia?

II. Surface.
- What is the difference in altitude from the southeast corner to the western boundary?
- What is the general character of the surface?
- What is meant by "bad lands"? Where are they situated?

III. Waters.
- What river drains the principal part of this state?
- What are the two river systems? What divides them?
- What territory do they drain?
- Are there any important lakes?

IV. Climate.
- What are the characteristics?
- What is the average temperature?
- In what way does the atmosphere resemble that of Minnesota?
- How does the rainfall differ in different sections?

V. Minerals.
- Is Nebraska an important state in mineral resources?
- What minerals are found there? Where are they found?

VI. Agriculture.
- What is the general character of the soil?
- What is meant by irrigation? Where is it practiced?
- What are the leading crops? What one grain occupies the most acreage?
- What part of the state is devoted to stock raising?

VII. Population.
- What is the average population to the square mile?
- What proportion of the total population are negroes? Indians?
- How does Nebraska rank in population with other states?

VIII. Manufactures.
- Is manufacturing an important industry in this state?
- What special industries are carried on?
- What important industry is carried on at South Omaha?

IX. Commerce.
- What portion of this state has the best railroad facilities?
- How does its mileage compare with that of Illinois?
- How do Nebraska's exports differ from those of Michigan?
- What are some of the imports?

X. Education.
- From what is the school fund derived?
- What is the percentage of illiteracy among the white population?
- How are the city schools managed? The country schools?
- Name three universities in this state.

XI. History.
- Name two early explorers.
- How was this state connected with the Louisiana Purchase?
- When was Nebraska established as a territory?
- When was it admitted to the Union?
- What progress has it made?

ITEMS OF INTEREST.

Nebraska is an Indian name meaning "Water Valley."
Grand Island is noted for the manufacture of beet sugar.
The percentage of illiteracy among the white population of this state is 8.2 per cent.
At Long Pine, North Platte, Alliance and McCook central time changes to western.
Omaha has the largest smelting works in the United States.
Nebraska ranks third in number of swine.

New York

"THE EMPIRE STATE."

I. LOCATION.
- Position in U. S.
- Latitude and longitude.
- Boundaries.

II. SIZE.
- Length.
- Breadth.
- Area.
- Comparative.

III. OUTLINE.
- Irregular.
- Map study.

IV. SURFACE.
- Diversity.
- Characteristics.
- Mountain regions.
- Valleys.
- Plateaus.
- Plains.

V. DRAINAGE.
- River systems.
- Lakes.
- Waterfalls.

VI. CLIMATE.
- Variety.
- Influence.
- Rainfall.

VII. MINERAL RESOURCES.
- Variety.
- Value.
- Importance.
- Uses.

VIII. AGRICULTURE.
- Importance.
- Character.
- Variety.
- Localities.

IX. INDUSTRIES.
- Manufacturing.
- Extent.
- Variety.
- Quarries.
- Lumber.

X. COMMERCE.
- Volume.
- Cause.
- Railways and canals.
- Imports and exports.

XI. CITIES.
- Important ones.
- Characteristics.
- Population.

XII. EDUCATION.
- Public schools.
- Officers.
- Normal schools.
- Universities.

XIII. GOVERNMENT.
- 1. Legislative.
  - Members.
  - Terms.
- 2. Executive.
  - Officers.
  - Terms.
- 3. Courts.
  - Classes.
  - Judges.
  - Terms.

XIV. HISTORY.
- Early settlement.
- Revolutionary war.
- Constitution.
- Civil war.
- Later history.
- Prominent men.

ITEMS OF INTEREST.

New York is the first state in the Union in population, value of farm products, manufacturing industries and extent of commerce.

The East River is the busiest river of its size in the world.

The Bartholdi statue, "Liberty Enlightening the World," which stands at the entrance of New York Harbor, is 305 feet high from the foundation to the top and is the largest statue in the world.

NEW YORK
"EMPIRE STATE"
Rose - State Flower
PRESIDENTS AND NOTED MEN.
WASHINGTON IRVING
PETER COOPER
MARTIN VAN BUREN
MILLARD FILLMORE
THEODORE ROOSEVELT
ALTON B. PARKER
GOV. CHAS. HUGHES.
LAKE ONTARIO
L. ERIE
OSWEGO
SYRACUSE
ROCHESTER
NIAGARA FALLS
BUFFALO
TROY
ALBANY
CATSKILL MTS.
BINGHAMTON
ELMIRA
HUDSON R.
KINGSTON
NEWBURG
WEST POINT
SING SING
NEW YORK
LONG ISLAND
BROOKLYN
Products
IRON ORE
LIMESTONE
MARBLE
BRICK
OIL
ROCK SALT
COTTON AND WOOLEN
PHOTOGRAPHIC SUPPLIES
Niagara Falls
Statue of Liberty
New York ranks first in Milch Cows, Hay Commerce & Manufacturing Population

Two-thirds of the leather gloves and mittens manufactured in the United States are made at Gloversville and Johnstown.

Troy manufactures more shirts, cuffs and collars than any other place in the United States.

Buffalo is known as the "Queen City of the Lakes."

West Point is called the "Military City."

Syracuse is noted for its salt; Oswego for its wheat starch.

Brooklyn is known as the "City of Churches," and contains the largest church in the United States.

Rochester is sometimes called the "Flour City."

The most important industry of New York City is the manufacture of clothes.

New York ranks first in production of gypsum, potatoes and hay.

QUESTIONS ON NEW YORK.

To what group of states does New York belong?

What states form its boundaries? What water?

What proportion of lakes Erie and Ontario belong to New York?

How does New York compare in size with California? With Montana?

Into how many physical regions is New York divided ? How are they characterized?

Name three mountain ranges. In what part of the state are they located?

To what range does Mt. Marcy belong? Slide Mountain?

Where is the plateau region? The lake shore plain?

What is the most important river in the state? What does it drain?

How is the northeastern portion of the state drained?

Name three important falls. How do they affect this state's industries?

What three things affect the climate of New York?

What is the average temperature? Rainfall?

What minerals are found in the vicinity of the Hudson river?

How does New York compare with Minnesota and Michigan in the production of iron ore?

Does any other state produce more oil? How much more?

In the production of what mineral does New York rank first?

What tends to give the wide diversity in agricultural interests?

How do the farms along the Hudson differ from those of the plateau region? What crops are raised?

Name the chief manufacturing centers.

How does New York compare with other states in the extent of its manufactures?

Name the most important city. How is it distinguished? For what is Buffalo important? Troy? Rochester?

Who is at the head of the public school system? What is the state board of regents?

Name three important universities. Are any of them connected with the state?

How does New York rank in commerce? In what way is it especially adapted?

What proportion of the exports of the U. S. pass through New York? What imports?

What does the Erie canal connect? How long is it?

What two noted explorers first visited New York?

When was New York City founded? What was its original name?

When did the Dutch give up New York? What was the cause?

What noted man played an important part in the Spanish-American war?

Name some noted men that have come from this state.

New York City

"Empire City."

- DESCRIPTION.
  - Location.
  - Area.
  - Population.
  - Boroughs.
- ADVANTAGES.
  - Natural.
    - On ocean.
    - On river.
    - Harbor.
  - Artificial.
    - Railroads.
    - Docks.
    - Cable stations.
    - Wireless stations.
    - Bridges.
    - Ferries.
- PARKS.
  - Battery.
  - Riverside.
  - Central.
  - Bronx.
- MONUMENTS.
  - Statue of Liberty.
  - Obelisk.
  - Washington.
  - Grant's Tomb.
- COMMERCE.
  - Facilities.
  - Extent.
- MANUFACTURES.
  - Amount.
  - Variety.
  - Value.
  - Most important.
    - Clothing.
    - Sugar refining.
    - Molasses refining.
    - Printing.
    - Publishing.
- BUILDINGS.
  - Postoffice.
  - Sub-treasury.
  - Custom house.
  - Hotels.
  - Theaters.
  - Churches.
  - Libraries.
  - Museums.
  - Universities.
  - Charitable institutions.
  - Stock Exchange.
- HISTORY.
  - Henry Hudson.
  - Colonization.
  - Government.
  - Revolutionary war.
  - Washington inaugurated.
  - Growth.
  - Tweed Ring.
  - Prosperity.

ITEMS OF INTEREST.

Wall street is the financial center of the United States.

The first president of the United States was inaugurated in this city.

New York is the largest city in the Western Hemisphere and second largest in the world.

Central park is one of the finest parks in the world and contains an obelisk sent from Egypt by Ismail Pasha at the expense of William H. Vanderbilt.

New York City spends more for public education than any other city in the world.

The commerce of New York City is five times greater than that of the next largest American port.

In manufactures, New York surpasses every other city in the United States by more than 50 per cent.

New York ranks first in the printing and publishing business.

QUESTIONS.

Who was the first white man to enter New York harbor? How many years elapsed before the visit of Henry Hudson?

Which is more valuable, the foreign or coast trade of this city?

Name two ways in which New York outranks other cities in her manufactures.

Where is the most densely populated district? What is the average population to the acre in this district? What percentage is foreign?

What can you tell of the obelisk in Central park?
For what is Wall street noted? Fifth avenue?
What natural commercial advantages has this city?
What facilities has New York for communication with the world?
What improvement gave an impetus to this city's growth?

Cincinnati

"Queen City."

SITUATION.
- In state.
- In United States.

SIZE.
- Area.
- Population.

DRAINAGE.
- Ohio river.
- Mill creek.
- Miami canal.

SURFACE.
- Slope.
- Hills.
- Bluffs.
- Irregularity.

PUBLIC BUILDINGS.
- Most important.
- Libraries.
- Churches.
- Institutions.

COMMERCE.
- Railroads.
- Steamships.
- River traffic.
- Wholesale trade.

MANUFACTURING.
- Slaughtering.
- Meat packing.
- Pottery works.
- Machinery.
- Other articles.

HISTORY.
- First settlement.
- Fort Washington.
- County seat.
- Incorporation.
- Under martial law.
- Floods.
- Later events.

FACTS ABOUT CINCINNATI.

Cincinnati is called the "Queen City of the West," and is the second largest and most important city in Ohio.

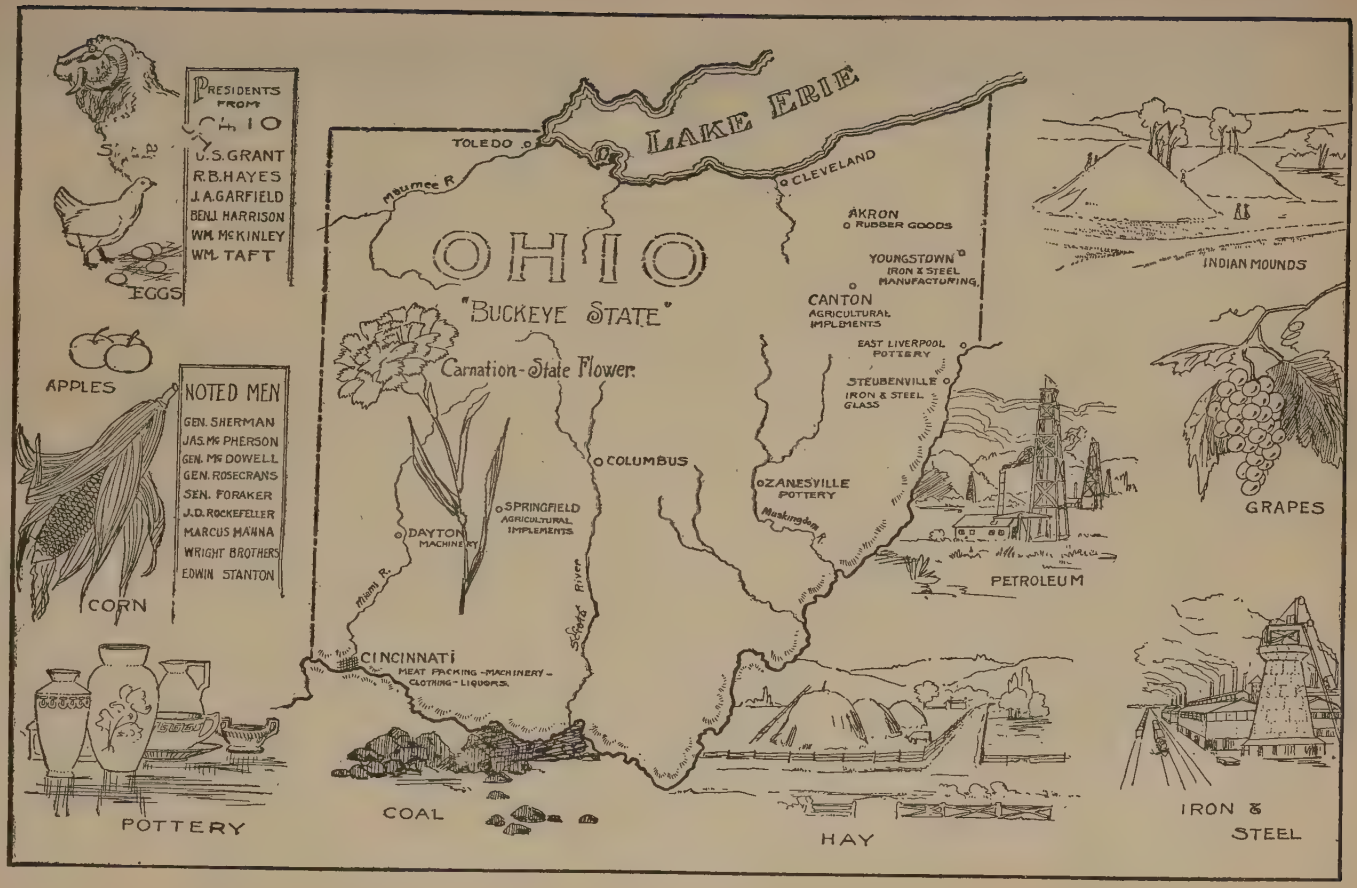
Cincinnati was named by Gen. Sinclair, governor of the Northwest Territory, in 1790.

The most beautiful park in the city is called Eden park and contains 216 acres.

The portion of the city almost entirely populated by Germans is sometimes called "Over the Rhine."

QUESTIONS.

What other cities in the United States are larger than Cincinnati?
Is Cincinnati nearer Chicago than New York?
On what kind of land is this city built? By what is it surrounded?
To what is the lower part of the city devoted? The middle slope? The highest slope?
How many bridges span the river? Which is the largest?
What suburbs of this city are in Kentucky? In Ohio?
What is peculiar about the streets in this city?
What monument in this city commemorates the Civil war?
How does this city's position especially adapt it for commerce? For what is it a distributing point?
How does Cincinnati rank as a manufacturing center? Do any other cities do more meat packing and slaughtering?
What great pottery works are situated in this city? For what is the pottery noted?
Who first visited the site of Cincinnati? How did it get its name?
What critical position was this city in during the Civil war? What was a result?
Name some later important events occurring in this city.


LAKE ERIE
OHIO
"BUCKEYE STATE"
Carnation - State Flower
TOLEDO
CLEVELAND
Maumee R.
AKRON
RUBBER GOODS
YOUNGSTOWN
IRON & STEEL MANUFACTURING
CANTON
AGRICULTURAL IMPLEMENTS
EAST LIVERPOOL
POTTERY
STEUBENVILLE
IRON & STEEL GLASS
COLUMBUS
ZANESVILLE
POTTERY
Muskingum R.
SPRINGFIELD
AGRICULTURAL IMPLEMENTS
DAYTON
MACHINERY
Miami R.
Scioto River
CINCINNATI
MEAT PACKING - MACHINERY - CLOTHING - LIQUORS.
PRESIDENTS FROM OHIO
U.S. GRANT
R.B. HAYES
J.A. GARFIELD
BEN'L HARRISON
WM. McKINLEY
WM. TAFT
EGGS
APPLES
NOTED MEN
GEN. SHERMAN
JAS. Mc PHERSON
GEN. Mc DOWELL
GEN. ROSECRANS
SEN. FORAKER
J.D. ROCKEFELLER
MARCUS HANNA
WRIGHT BROTHERS
EDWIN STANTON
CORN
POTTERY
COAL
HAY
PETROLEUM
INDIAN MOUNDS
GRAPES
IRON & STEEL

Washington

"The City of Magnificent Distances."

- DESCRIPTION.
  - Location.
  - Area.
  - Population.
  - Plan of city.
    - Central point.
    - Direction of street.
    - Sections.
- PARKS.
  - Capitol Hill.
    - Description.
    - Size.
    - Situation.
  - Executive grounds.
  - Lafayette square.
  - The Mall.
- COMMERCE AND INDUSTRY.
  - How controlled?
  - How affected?
  - Extent.
  - Retail trade.
- EDUCATIONAL INSTITUTIONS.
  - School system.
    - Organization.
  - Universities.
  - Scientific bureaus.
  - Institutions.
- GOVERNMENT.
  - How unique?
  - How controlled?
- PUBLIC BUILDINGS.
  - Capitol.
    - Departments.
    - Famous doors.
    - Interior.
  - White House.
    - Architecture.
    - Gardens.
    - Interior.
  - Congressional Library.
    - Size.
    - Number of books.
    - Architecture.
    - Interior.
  - Department of Agriculture.
  - Bureau of Engraving and Printing.
  - Treasury building.
  - State, War and Navy building.
  - Government printing office.
  - Pension office.
  - Interior department.
  - National Museum.
  - Smithsonian Institution.
  - Corcoran Art Gallery.
- HISTORY.
  - Distinction.
  - Planned by L'Enfant.
  - Burned by British.
  - Rebuilt.
  - Later changes.

INTERESTING ITEMS.

Washington is the only city in the world designed especially for the capital of a nation.

The site of Washington was selected by General Washington. Charles L'Enfant, a French engineer, drew the plans for the entire city.

The public schools in Washington were organized by a board of trustees, of which Thomas Jefferson was the fifth president.

Washington is well named "The City of Magnificent Distances," for its system of streets, avenues, parks and vistas eclipse any other city in the world.

The Congressional Library building is the grandest library building in the world.

The Washington Monument, which is about a mile from the capitol building, is the highest in the world and is called "the world's greatest cenotaph."

QUESTIONS.

What is unique about the plan of this city? Around what does it center?

Traveling at the rate of forty miles an hour, how much longer would it take you to go from Washington to Chicago than it would from Washington to New York?

What is the Mall? To what does it lead?

By whom were the doors of the east entrance made? What do they depict?

Where is the library of congress? How does it compare in number of books and beauty of building with other libraries in the United States? In the world?

What is unique about the government of this city?

What fact influences its trade and commerce? When is this most noticeable?

What prominent men were connected with the founding of the city?

When and by whom was this city almost demolished? What checked it?

Oklahoma

"The Boomer State."

Situation.
- Position.
- Group.
- Latitude.
- Longitude.

Size.
- Length.
- Breadth.
- Area.
- Comparative.

Outline.
- Regular.
- Boundaries.

Surface.
- Plateaus.
- Prairies.
- Hills.
- Valleys.
- Plains.

Drainage.
- Rivers.
- Tributaries.
- Location.

Climate.
- Temperature.
- Characteristics.
- Rainfall.

Mineral Resources.
- Coal.
- Gypsum.
- Granite.
- Petroleum.
- Natural gas.

Agriculture.
- Advantages.
  - Soil.
  - Climate.
  - Rainfall.
- Irrigation.
- Crops.
  - Corn.
  - Wheat.
  - Oats.
  - Cotton.
- Live stock.
  - Cattle.
  - Horses.
  - Mules.
  - Sheep.

Manufactures.
- Development.
- Cotton gins.
- Mills.
- Lumbering.

Indian Reservations.
- Five Nations.
- Government.
- Education.
- Industry.

Population.
- Present.
- Increase.
- Indians.
- Negroes.

Cities.
- Guthrie.
- Oklahoma City.
- Ardmore.
- Enid.

Education.
- Public schools.
- Normals.
- Universities.

History.
- Indian tribes.
- Purchase.
- Settlement.
- Territory.
- Enabling Act.
- Admission.

ITEMS OF INTEREST.

"No Man's Land" is a strip of land which was ceded to the United States by Texas and was included in Oklahoma Territory in 1889.

Oklahoma was originally part of Indian Territory, and was purchased from the Indians in 1889.

The name "Boomer State" was given on account of the great number of people who rushed into Oklahoma when it was opened for settlement and cities were built in a few days.

Oklahoma is the Choctaw name for the Home of the Red Men.

Oklahoma ranks first in production of petroleum.

QUESTIONS ON OKLAHOMA.

To what group of states does Oklahoma belong? What states form its boundaries?

What proportion of the area of the state is water?

What portion is known as "No Man's Land"?

How is the surface of the northeastern part of the state different from the central part? The western? The southeastern?

What are the important rivers? What territory do they drain?

What is the climate of this state? What is the average rainfall? In what portion of the state is irrigation essential?

How does the annual output of coal compare with that of Illinois?

What other resources are being developed?

What agricultural advantages has this state?

Name the principal cereal grown. What is the annual output of corn?

What is the annual output of cotton in bales? In pounds?

In what part of the state is live stock principally raised? What domestic animals are raised?

What is known as the cotton region? What industries are found there?
In what part of the state is lumbering carried on?
What is the principal industry of the Indians?
What proportion of the total population is Indian? Colored?
What system of education did Indian Territory have? When were government schools established there?
How are the Indians educated?
How did the enabling act affect the schools?
For what was Oklahoma originally set apart? How were the Indians governed?
When and by what means was this state thrown open to settlement?
What was remarkable about the opening of this territory?
When was the enabling act passed? What did it provide?

Pennsylvania

"The Keystone State."

I. Position.
- In what latitude and longitude is Pennsylvania?
- What other states are in the same latitude?
- How many states form its boundaries?
- How does it rank in size with the other states?

II. Surface.
- How is the surface divided?
- Where is the Piedmont plateau?
- Where is the mountainous region?
- How do the eastern and western slopes of the mountains differ?
- Where is the Alleghany plateau?

III. Drainage.
- What river drains the eastern portion of the state? The northeastern and central parts? The Alleghany plateau?
- What is meant by a "tarn"? Where are they found?

IV. Climate.
- What are the characteristics of the northwest and western parts of the state?
- How do they differ from the mountainous region? From the eastern section?
- What is the difference in rainfall in the western and eastern counties?
- Where is the heaviest snowfall? How does it affect the rivers?

V. Resources.
- What is the principal mineral found? In what districts is it located?
- Where are the bituminous coal mines found?
- How does Pennsylvania rank in production of coal?
- What other minerals are found between the seams of coal?
- Does any other state exceed it in production of oil?

VI. Agriculture.
- What proportion of the state is devoted to agriculture?
- Where is the most fertile soil found?
- How does farming in Pennsylvania differ from that of Michigan?
- In the production of what grain does Pennsylvania take first place?
- Name another valuable branch of industry.

VII. Population.
- How does Pennsylvania compare with other states in population?
- What other state has a larger population?
- What per cent of the total population is colored?
- What is the population to the square mile?

VIII. MANUFACTURING.

How do the manufactures of Pennsylvania compare with its mining?
What are some of the principal manufactures?
When was the first blast furnace opened? By whom?
Name six manufactures in which Pennsylvania ranks first.
What industry ranks second?

IX. COMMERCE.

For what are the canals principally used?
What are the chief railroad centers?
What are the important exports? Imports?

X. HISTORY.

When was the first permanent settlement made?
To what countries did Pennsylvania belong?
Why was it called Pennsylvania?
What position did it take in the French and Indian war?
What part did it play in the Revolutionary war?
What side did it favor in the Civil war?
How many years ago did it become a separate state?

ITEMS OF INTEREST.

Pennsylvania ranks twenty-ninth in size in the United States.
The output of coal exceeds in value the total mineral product of any other state.
Sixty-seven per cent of the area of Pennsylvania is devoted to farming.
Pennsylvania ranks second in population.
One-half of the Portland cement produced in the United States is obtained in Pennsylvania.
The origin of the name Pennsylvania is Latin and means "Penn's Woody Land."
The state motto is "Virtue, Liberty, Independence."
Erie is the only lake port in Pennsylvania.
Pennsylvania ranks first in slate, lime, coal, natural gas and in stone products.
Independence Hall in Philadelphia has been called the "Mecca of American Freemen," as it was here the Declaration of Independence was written and signed.
Pittsburg contains the greatest number and variety of factories in the world, and contains the largest ax factory in the world.
Pittsburg ranks first in iron and steel industry in the United States, and is the greatest oil market in the world.
Pittsburg manufactures more glassware than any other city in the United States.
The first oil well in the United States was bored at Titusville, in 1859.
Pottsville contains the deepest coal mine in America.
Pennsylvania is sometimes called the "Black Diamond State" on account of its coal mines.
The first United States mint was established in Pennsylvania.

Philadelphia

"The Quaker City."

DESCRIPTION.
- Location.
- Size.
- Population.

HOMES.
- Size.
- Number.
- Architecture.

PARKS.
- Squares.
- Fairmount park.
  - Divisions.
  - Rivers.
  - Zoological Gardens.

COMMERCE AND INDUSTRY.
- Foreign.
- Domestic.
- Extent.
- Docks.
- Manufactures.

Importance.
Extent.
Shipbuilding.
Locomotive Works.

HISTORICAL ITEMS.
Penn's Cottage.
Home of Robert Morris.
Carpenter's Hall.
Independence Hall.
Old Liberty Bell.
Betsy Ross House.

PUBLIC BUILDINGS.
City Hall.
Federal Buildings.
U. S. Mint.
Postoffice.
Customhouse.
Arsenal.
Office buildings.
Theaters.
Churches.
Charitable Institutions.
Universities and Colleges.

HISTORY.
First settlement.
English settlement.
Chartered.
Revolutionary center.
National Capital.
Prominence.

ITEMS OF INTEREST.

Philadelphia is the center of the greatest carpet manufactures in the United States.

Near Philadelphia are the largest and most important shipbuilding yards in the United States.

Philadelphia still retains many of its old customs, houses and laws, probably to a

Philadelphia still retains many of its old customs, houses and laws, probably to a greater extent than any other city.

Philadelphia was the capital of the United States for ten years.

Independence Hall, in this city, has been called the "Mecca of American Freemen" as it was here the Declaration of Independence was written and signed.

Philadelphia is known as the "City of Homes" on account of the large number of small homes found in it.

The first United States mint was established in this city.

Philadelphia leads in the manufacture of hosiery and export of coal.

The first American flag was made in Philadelphia.

The Bank of North America in Philadelphia is the oldest in the United States.

The First and Second Continental Congress assembled in Carpenter's Hall.

The Baldwin Locomotive Works in this city are the largest in the world.

QUESTIONS.

By what rivers is this city drained?

What is characteristic of the homes in Philadelphia? What is the general effect?

By what three names is this city called? How is each name appropriate?

By whom was the first brick house in Philadelphia erected? Where does it now stand?

The home of what American patriot now stands on Lemon street?

For what is Carpenter's Hall noted? Independence Hall?

Where was the first American flag made? By whom?

Name three other buildings famous in revolutionary times which are still preserved.

Describe the "public building." Into what departments is it divided?

What do the Federal buildings comprise?

Name three important educational institutions found in this city.

What other cities have more commerce and industry?

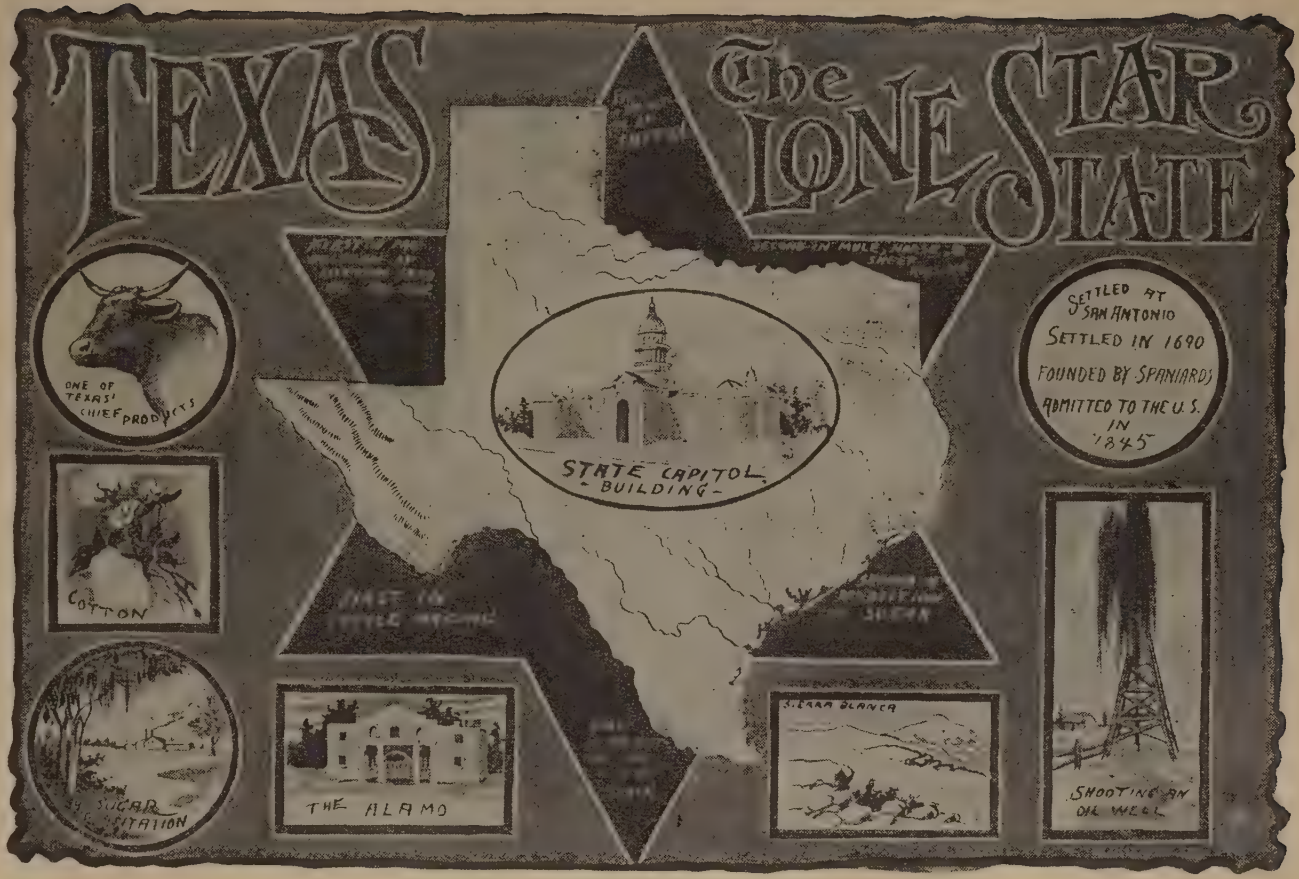
In what manufactures does this city lead?

For what part of the country is it a distributing point?

What was this city first called? When was it changed?

What part did this city take in the Revolutionary War?

In what three ways was it the most important city for many years?


TEXAS
The LONE STAR STATE
ONE OF TEXAS' CHIEF PRODUCTS
COTTON
SUGAR
STATE CAPITOL BUILDING
THE ALAMO
SETTLED AT SAN ANTONIO
SETTLED IN 1690
FOUNDED BY SPANIARDS
ADMITTED TO THE U.S. IN 1845
SHOOTING AN OIL WELL

Wisconsin

"The Badger State."

Position.
- Group.
- Boundaries.

Size.
- Area.
- Length.
- Breadth.
- Comparative.

Surface.
- Character.
- Plains.
- Elevations.
- Altitude.
- Ridges.
- Bluffs.

Drainage.
- Divisions.
- Rivers.
- Lakes.
- Water shed.

Climate.
- Seasons.
- Snowfall.
- Rainfall.

Minerals.
- Products.
- Location.
- Uses.
- Value.

Agriculture.
- Soil.
- Forests.
- Dairying.
- Crops.

Manufacturing.
- Variety.
- Development.
- Extent.
- Value.

Transportation.
- Lakes.
- Canals.
- Railroads.

Commerce.
- Extent.
- Exports.
- Imports.
- Trade centers.

Population.
- Relative.
- Comparative.
- Square mile.

Education.
- Expenditure.
- Schools.
- State schools.
- Universities.
- Institutions.

Cities.
- Madison.
- Milwaukee.
- Superior.
- Oshkosh.
- Racine.
- Green Bay.
- Fond du Lac.

History.
- Explorers.
- Missions.
- Treaty of Paris.
- Territorial.
- Admission.
- Civil war.
- Progress.

ITEMS OF INTEREST.

Wisconsin is an Indian word meaning "Wild Rushing Waters."

Wisconsin ranks second in production of zinc ore and third in mineral waters and lime.

Bayfield, Wis., is known as "The Village of Fountains," as almost every house has a natural fountain, caused by springs on the hills overlooking the village.

Milwaukee is called the "Cream City."

Madison is called the "Lake City" on account of its situation on four lakes.

Racine is noted for the manufacture of threshing machines.

The largest charcoal blast furnace in the world is at Ashland, Wis.

West Superior is noted for the building of ships, also for the largest system of connected grain elevators in the world.

Chippewa Falls contains one of the largest saw mills in the world.

Wisconsin leads in the production of hops.

QUESTIONS ON WISCONSIN.

What position does Wisconsin occupy in the United States?

What are its natural boundaries? Artificial?

What proportion of the area of the state is water?

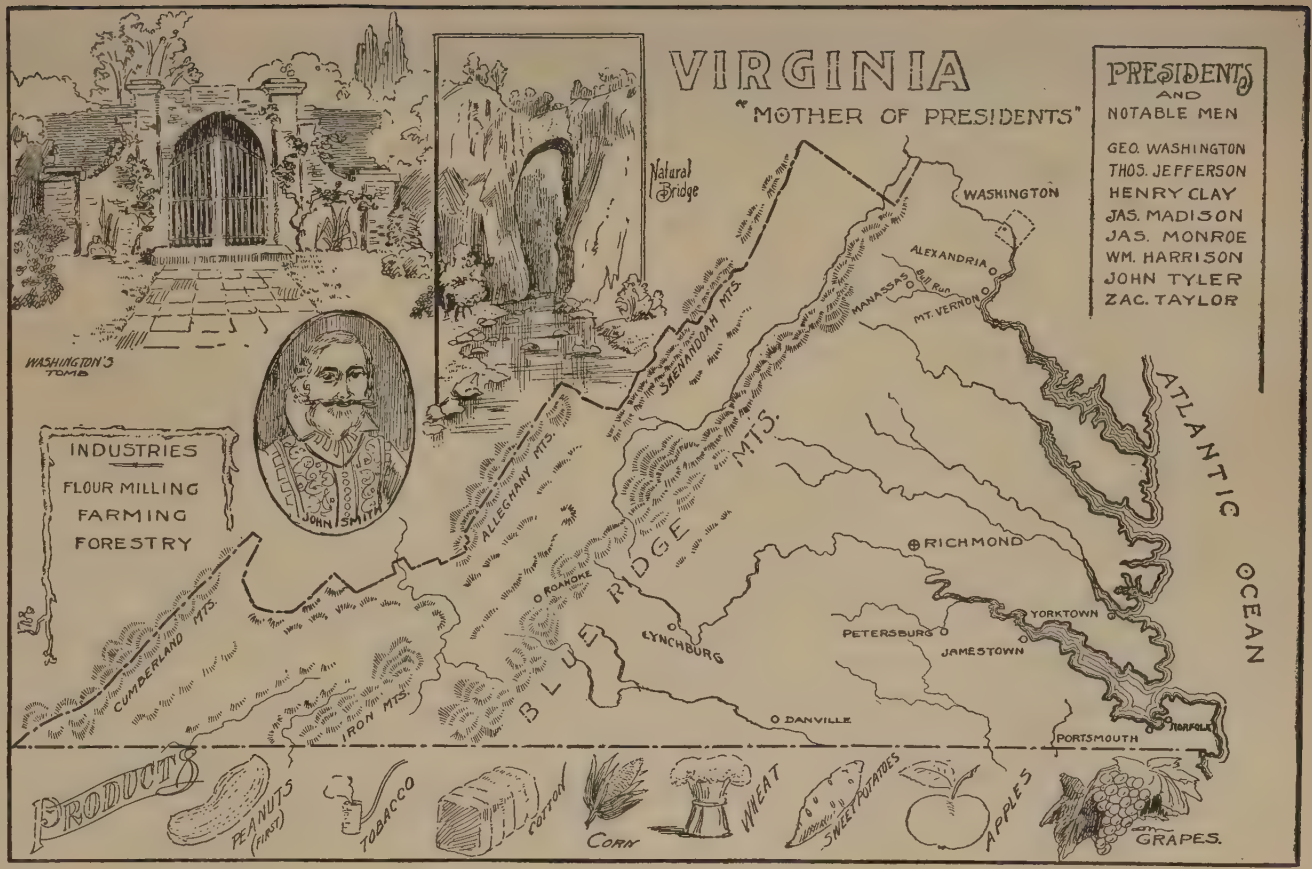
What is the approximate population to the square mile?

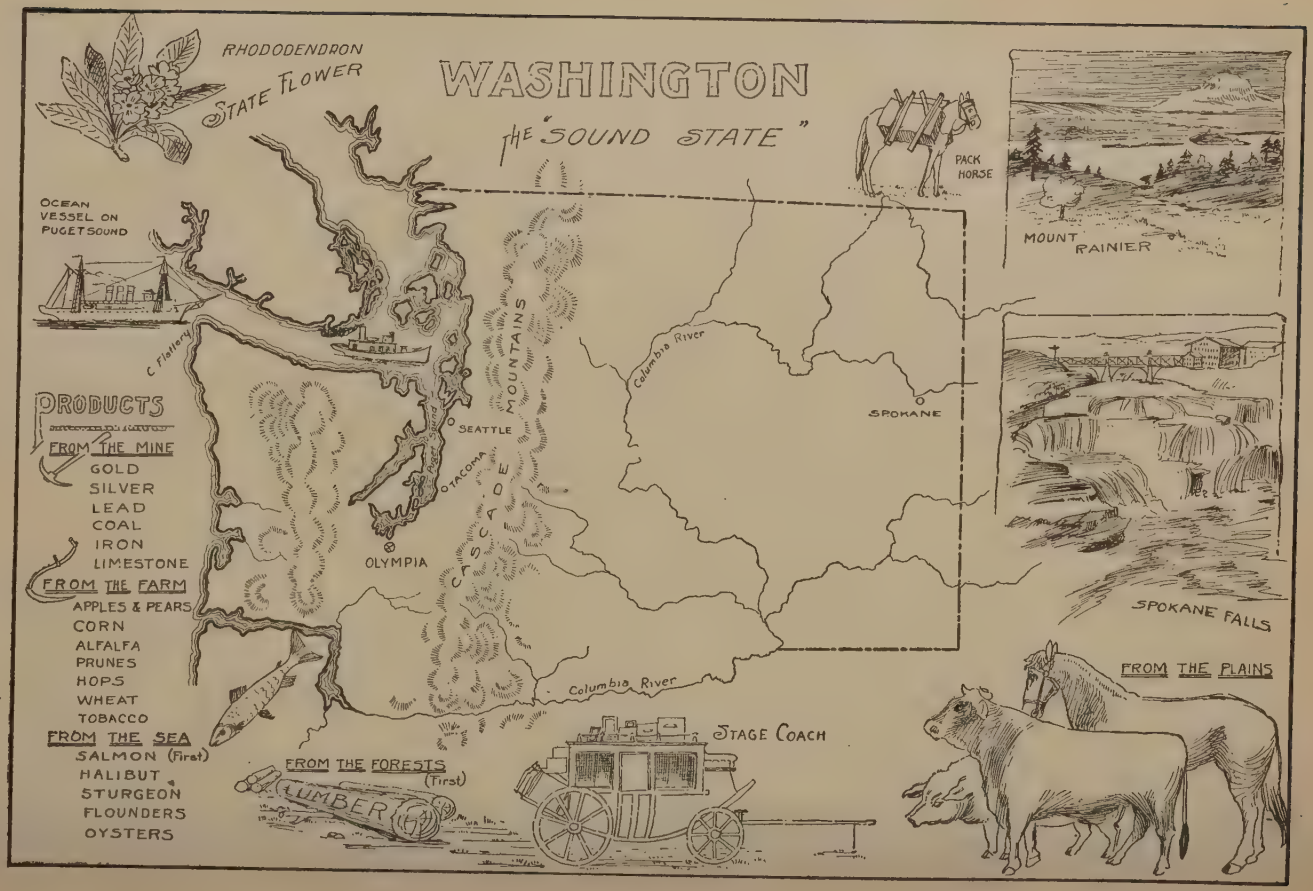
What is the general character of the surface?

Where is the highest altitude? Lowest? What forms the water sheds?

What drains the northwestern part of this state?

What proportion of the state is drained into the Mississippi river?


VIRGINIA
"MOTHER OF PRESIDENTS"
PRESIDENTS AND NOTABLE MEN
GEO. WASHINGTON
THOS. JEFFERSON
HENRY CLAY
JAS. MADISON
JAS. MONROE
WM. HARRISON
JOHN TYLER
ZAC. TAYLOR
Natural Bridge
WASHINGTON'S TOMB
JOHN SMITH
INDUSTRIES
FLOUR MILLING
FARMING
FORESTRY
WASHINGTON
ALEXANDRIA
MANASSAS
Bull Run
MT. VERNON
SHENANDOAH MTS.
ALLEGHANY MTS.
BLUE RIDGE MTS.
ATLANTIC OCEAN
RICHMOND
ROANOKE
LYNCHBURG
PETERSBURG
YORKTOWN
JAMESTOWN
DANVILLE
NORFOLK
PORTSMOUTH
CUMBERLAND MTS.
IRON MTS.
PRODUCTS
PEANUTS (FIRST)
TOBACCO
COTTON
CORN
WHEAT
SWEET POTATOES
APPLES
GRAPES.


RHODODENDRON
STATE FLOWER
WASHINGTON
THE "SOUND STATE"
PACK HORSE
MOUNT RAINIER
OCEAN VESSEL ON PUGET SOUND
C. Flattery
Puget Sound
SEATTLE
TACOMA
OLYMPIA
CASCADE MOUNTAINS
Columbia River
SPOKANE
SPOKANE FALLS
PRODUCTS
FROM THE MINE
GOLD
SILVER
LEAD
COAL
IRON
LIMESTONE
FROM THE FARM
APPLES & PEARS
CORN
ALFALFA
PRUNES
HOPS
WHEAT
TOBACCO
FROM THE SEA
SALMON (First)
HALIBUT
STURGEON
FLOUNDERS
OYSTERS
FROM THE FORESTS (First)
LUMBER
STAGE COACH
FROM THE PLAINS

In what part of the state is the Wisconsin river? For what is it noted?

How are the seasons characterized? Why is the climate of the eastern part more even in temperature than that of the rest of the state?

Where are the iron mines located?

What other minerals are found in this state? Where are they located?

What building materials are found?

What section is best adapted to agriculture? What grains are grown?

How does Wisconsin rank in dairy products?

How does the annual output of lumber compare with the yearly output of dairy products?

What waterways has Wisconsin? What railways?

Name two canals. What do they connect?

Name some of this state's exports. What do its imports consist of?

What is the chief center of trade on Lake Michigan? What is the commercial center for the northwestern part of the state?

Galveston

SITUATION.
POPULATION.
COMMERCE.
- Railroads.
- Steamships.
- Wharf.
- Exports.
  - Rank.
  - Articles.

INDUSTRIES.
- Manufactures.
- Ice Plants.
- Iron Works.
- Mills.
  - Flour.
  - Rice.
  - Cotton Seed Oil.

HISTORY.
- First settlement.
- Incorporation.
- Later events.
  - Great fire.
  - Flood.
  - Sea Wall.

FACTS ABOUT GALVESTON.

Galveston is the most important seaport of Texas and is situated on Galveston Island at the opening of Galveston Bay.

Chief among its industries is its commerce and next in importance is cotton pressing and the manufacture of oil and flour.

This city is only about five feet above sea level and to protect it from being submerged, a great wall has been erected at large expense.

QUESTIONS.

On what is the city of Galveston situated?

What improvement has been made in the channel? Of what benefit is this?

Name five of the principal industries in this city.

What articles are manufactured?

What advance has this city made in its export trade? How does it now rank?

Of what important product is Galveston the chief exporting point?

What was the cause of the great flood in this city? What damage did it do?

How is the city now protected?

How does the population of Galveston compare with that of New Orleans?

Name six articles, besides cotton, which are exported to other countries.

Baltimore

"Monumental City."

POSITION.
- In state.
- On river.
- Slope.

DIVISIONS.
- East.
- West.
- Sections.

SIZE.
- Population.
- Area.
- Shape.

PLACES OF INTEREST.
- Druid Hill Park.
- Parks and Squares.
- National Cemetery.

NOTABLE BUILDINGS.
- City Hall.
- U. S. Courthouse.
- Masonic Temple.
- Churches.
- Theaters.
- Hotels.

EDUCATION.
- Public Schools.
- Universities.
- Institutes.
- Libraries.

COMMERCE AND INDUSTRY.
- Favorable situation.
- Harbor.
- Railway center.
- Oyster fisheries.
- Shipbuilding.
- Manufacturing.
- Tomato and Oyster canneries.

HISTORY.
- Founded.
- Incorporated.
- War of 1812.
- Civil War.
- Growth.
- Disastrous fire.

POPULATION.
- White.
- Negro.

INTERESTING ITEMS.

Baltimore is the chief city in Maryland and the sixth in size and population in the United States.

Druid Hill Park, containing Druid Lake, is noted for its great beauty, its drives, walks and monuments.

At the erection of the statue of Washington, Baltimore was given the name of the "Monumental City."

Baltimore is the center of the oyster fisheries and is noted for its oyster and tomato canneries.

The ships constructed at Baltimore are famous throughout the world and are known as Baltimore Clippers.

A disastrous fire occurred in 1904 which destroyed about $80,000,000 worth of property.

The largest iron rolling mills in the United States are located in Baltimore.

The system of water works, used to obtain the city's water supply, is said to be the finest in the world.

QUESTIONS.

How does the area and population of Baltimore compare with that of Chicago? New York?

On what body of water is it situated?

How do the west and northwest sections differ from the eastern portion of the city?

In what three ways is the principal park in this city noted?

How does Baltimore's location affect her commerce?

Of what do the leading industries consist?

What is the most important industry in Baltimore?

What are the ships constructed in this city called?

How did the Civil War affect this city? What was the Baltimore Riot?

What disastrous event occurred in this city in recent years?

What per cent of the total population is colored?

Yellowstone Park

I. Situation.
  In state.
  In United States.
II. Size.
  Length.
  Breadth.
  Total area.
III. Surface.
  Volcanic.
  Irregular.
  Continental Divide.
  Mountains.
    Absarokas.
    Snowy Mts.
    Gallatin Range.
    Tetons.
  Valleys.
    Junction.
    Hayden.
    Madison.
IV. Rivers.
  Systems.
    Yellowstone.
    Missouri.
    Snake.
  Characteristics.
  Canyons.
    Golden Gate.
    Gibbon.
    Gardiner.
    Yellowstone.
V. Falls.
  Number.
  Beauty.
  Principal ones.
    Gibbon Falls.
    Kepler Cascade.
    Osprey Falls.
    Tower Falls.
    Falls of the Yellowstone.
VI. Lakes.
  Yellowstone.
    Size.
    Altitude.
    Distinction.
  Shoshone.
  Louis.
  Jackson.
VII. Hot Springs.
  Number.
  Temperature.
  Coloring.
  Mammoth Hot Springs.
    Terraces.
    Formation.
    Area.
    Altitude.
    Coloring.
  Turquois Spring.
  Prismatic Lake.
  Morning Glory.
  Emerald.
  Sapphire.
  Punch Bowl.
  Paint Pots.
VIII. Geysers.
  Classes.
  Difference.
  Geyser region.
  Fountain geysers.
  Old Faithful.
  Beehive.
  Giant.
  Giantess.
  Castle.
  Riverside.
IX. Forests.
  Extent.
  Trees.
  Animals.
  Roads.
X. Interesting Items.
  Obsidian Cliff.
  Mud geysers.
  Roaring Mountain.
  Fumeroles.

QUESTIONS ON YELLOWSTONE PARK.

For what is Yellowstone Park noted?

When was it made a national park? By whom?

In what state does it lie? What portions of its territory belonged to other states?

What is the character of the surface in the central part? By what is it bordered?

What tends to give diversity to the scenery?
What and where is the Continental Divide?
Where is Two Ocean Plateau? Why so called?
Name four ways by which the rivers are characterized?
What canyon in this park is considered the most beautiful in the world? Name some of its beauties.
Name some of the waterfalls found in this park. Which is the largest and most beautiful?
How does the altitude of Yellowstone lake compare with that of other lakes?
For what is The Thumb noted?
In what localities are hot springs most numerous? Describe some of them and name their peculiarities.
For what are the Mammoth Springs noted? What has caused their peculiar formation?
How does the number of springs compare with the number of geysers?
Where do most of the geysers occur? What causes the eruption of a geyser?
What two classes of geysers are found in this park?
How does the eruption of the Giant compare with that of Old Faithful?
Describe Obsidian Cliff and Roaring Mountain.
What are Fumeroles? Where do they occur?
What animals are found in this park? How are they protected?
How many days does it usually take to make a trip through this park?
When is the best time to visit it?

Mammoth Cave

I. Location.
  State.
  Section.
II. Size.
  Diameter.
  Area.
  Length.
  Width.
  Height.
III. Formation.
  Main cave.
    Size.
    Chief City.
    Star Chamber.
    Description.
    Caverns.
    Levels.
    Passageways.
    Mineral deposits.
IV. Rivers.
  Principal ones.
  Size.
  How named.
V. Curiosities.
  Blind fish.
  Blind grasshoppers.
  Blind insects.

QUESTIONS.

How does Mammoth Cave compare in size with other caves in the world?
In what state is it situated? Near what river?
How many miles in diameter?
How far have the passageways been explored?
How large is the main cave? How is it divided?
How does the size of the Chief City compare with that of the main cave?
Describe the Star Chamber. Why so called?
How did Echo river get its name?
How is the altitude divided? To what do they lead?
How do you account for the fish and other animals being blind?
In what year was this cave discovered?
What connection did it have with the war of 1812?

Africa Outline with Questions

Position.

What other grand divisions in the same hemisphere?

Is it located wholly in the northern or southern hemisphere?

Are more degrees of latitude embraced in its extent than that of Asia?

Does it extend over more degrees of latitude than longitude?

Contrast its position with that of Europe.

Does its southern cape extend further south than the southern cape of South America?

How many degrees south of where you live is the parallel of latitude which passes through Cairo?

Does Africa stretch entirely across any one zone?

Is there any other grand division which stretches entirely across this zone?

What grand division of the new world occupies the same relative position?

Size.

Compare the size of Africa with that of each of the other continents.

How many continents are larger than Africa?

How does it compare in size with Australia? With Alaska?

How does its greatest width compare with that of Asia?

What proportion of land in the torrid zone is contained in this grand division?

Draw squares showing the relative size of the five grand divisions, inclosing the smaller within the larger.

Boundaries

What oceans, seas and gulfs surround Africa?

What strait separates it from Europe?

What isthmus joins Asia and Africa?

What canal crosses the isthmus?

What cape forms the southern extremity of Africa?

What waters would you pass through in going from the Atlantic to Madagascar by the shortest route?

How does the coast line of Africa compare with that of Europe?

Take an imaginary journey along its sea coast. Why is it peculiar?

Is Africa really a peninsula?

This continent shows a marked resemblance in outline to which one of the Americas?

Which has the more compact configuration, Africa or Europe?

How does Africa rank as to good harbors?

Considering its size, how does its length of coast line compare with other continents?

Why is it the most inaccessible continent?

Why has this condition retarded commerce?

Where are the first settlements naturally made when opening up a new continent?

Make a simple sketch of the Atlantic and compare outline of Africa with South America in reference to its inlets, etc.

What is the distance from London to Calcutta via the Suez Canal? Via the Cape Town route?

Islands.

What interesting fact is connected with the island of St. Helena?

In what early exploration did a navigator land at Cape Verde Islands?

Distinguish between oceanic and continental islands. What is the name of

the largest oceanic island? What is its size? How far from the mainland? How does this island compare in size with any individual state of the United States?

What coast islands are used as naval stations by the English? By the French?

Compare Madagascar with Cuba in regard to its latitude, area, outline, etc.

Surface.

Are the mountain ranges continuous or disconnected?

What is the important range of the northern section?

What is the greatest height of its peaks?

Describe the surface of Sahara.

What are the Wadys which cross the Sahara?

Where is the Sudan?

What mountains form the highlands at the head of the Gulf of Guinea?

From our relief map give the location of the principal mountain ranges.

Is it usual for the mountains to be located along the coast line? In what manner does this affect the country in regard to its rivers, exploration, commerce, inland and foreign, and its growth along other lines?

In what part of Africa are the loftiest mountains?

What section of Africa was explored by Livingstone?

What other noted explorer followed him? What was his primary object?

In what respect is the surface and soil of southern Africa similar to South America?

Would this continent be classed as a great plain or plateau?

Compare the plateaus of Africa with those of other continents in size, production, etc.

Locate the highlands of Africa. The lowlands. The fertile regions. The desert regions.

What part of America is in the same latitude as the highlands of Africa?

Rivers.

What are the four great river systems of Africa?

How many of these flow into the Atlantic Ocean?

What two have their source in the equatorial regions?

What is it that obstructs navigation in these streams?

What determines the course of the following rivers: Nile, Kongo and Niger?

Are the rivers of Africa, generally speaking, suitable for commerce? Why?

How do the large rivers of Africa differ from those of North America? In what points do they resemble them?

Why is it possible for the Nile to flow through desert land for hundreds of miles with scarcely any tributaries?

Explain the causes and results of the overflowing of the Nile.

Contrast the Nile and the Mississippi rivers in reference to their length, width, navigation, and drainage. The same in reference to the Amazon.

Why do the systems of drainage of central Africa and central South America resemble each other?

What hindrances to exploration of central Africa has this condition offered?

Draw sketch showing drainage system of different sections of Africa.

What is the important river of the north? South? East? West? Central?

Upon what sources do the Nile and Kongo rivers depend for their abundant water supply?

What river offers the best entrance to central Africa?

Lakes.

How do the great lakes of Africa compare with those of other continents?

Which is the largest lake? What is its size? How does it compare with Lake Superior?

In which lake does the Kongo have its source?

Where is Lake Chad? What is interesting about this lake?

Has Africa any salt lakes?

Our knowledge of the lake system of central Africa is largely due to what explorer?

In what part of Africa are the lakes generally found?

What lake is one of the sources of the Nile?

What rank do the lakes of Africa take in regard to size?

Have these lakes any commercial value at the present time? To what extent?

What is the area of Lake Tanganyika? Victoria Nyanza?

How do these lakes compare with Lake Superior in size?

Climate.

Why is the climate of Africa more uniform than that of any other continent?

How far north does the tropical region extend?

What causes sea breezes to blow over Sahara in summer? Why is there no rain from these winds?

Why is the southern part of Africa cooler than the corresponding latitudes of the northern part?

What causes two rainy seasons in the equatorial regions?

In what part of Africa does rain never fall?

Into how many zones does Africa extend? Give the territory included in each.

What effect do the mountains have upon the climate? Why?

How do the Atlas mountains affect the climate of the Barbary States?

It is said that Egypt resembles southern California in climate. Give reasons.

Why is not the northern part of South America a desert like the northern part of Africa?

How does the climate of the different regions of South America compare with the corresponding regions of Africa?

How does the climate of the central part of Africa compare with that of central South America?

How have these conditions hindered progress in central Africa?

How many seasons throughout the greater part of Africa?

What can you say of the climate along the coast lines?

Where is the climate said to be deadly?

What is the cause of this condition?

Why is Africa the hottest of the continents?

What are the climatic conditions in the Sahara?

Where is the excessive rainfall of Africa and what regions are temperate and wholesome?

What is the climate of the northern part of Africa? Eastern? Central Southern?

What are some of the controlling influences?

Is there a similarity of climate between the northern and southern parts of Africa?

Vegetation.

How does rainfall affect vegetation?

What causes the dense vegetation of the Kongo basin?

Where are the forest regions?

In what section are the grazing lands?

Why is the vegetation of Africa less varied than that of other continents?

Give reasons for the abundant vegetation of northern Egypt.

How far back does this condition date?

In what part of Africa is agriculture carried on by means of irrigation?

In what regions are the dense forests of Africa located?

Where is the date palm found?

What products would you expect to find in northern Africa? Southern? Eastern? Central? Why?

With what vegetable products of Africa is the United States familiar?

From what city are the best dates shipped? Figs? Olives?

What other vegetable products are shipped to foreign countries?

Name trees from which products of commerce are obtained.

Is the soil of Africa as well adapted to cultivation as that of South America?

How many kinds of palm trees and fruit are shown in the full-page illustration?

Minerals.

How do the rock formations show that Africa has had fewer convulsions than the other continents?

What are the most valuable building stones of Africa?

How long have the granite and syenite of the Nile basin been known to the civilized world?

In what other part of Africa are extensive deposits of granite found?

Where are the iron and copper deposits? What skill have the natives in the use of these ores? Are the mines developed?

What is known of the coal deposits?

Where are the most important mining regions of Africa?

Where are the noted diamond mines located?

What has made Johannesburg a large and important city?

Where is Kimberley? What has brought it into prominence?

Has the mining of other common metals been developed to any extent in the south?

What important mineral is found in the desert of Sahara?

For what minerals are the Barbary States noted?

What percentage of the world's supply of diamonds does southern Africa supply?

Animals.

What is the most interesting feature of the animal life in Africa?

Give a reason why the largest members of the animal kingdom are found in so many regions of Africa.

What family of animals is spread over the whole continent?

How many species of mammals are peculiar to Africa?

How many species of the antelope family are found there?

What is the most valuable bird of Africa?

In what region is the camel found?

What celebrated bird of commerce is found in Africa? Tell of the industry.

In what regions are the large and fierce wild animals found? Name some of them.

Do the animals of central Africa resemble those of central South America? Of Asia?

For what is the elephant hunted?

Name the domestic animals of Africa and the purpose for which they are used.

In what sections is stock raising pursued?

Name the animals and birds from which commercial products are obtained; give the name and value of same, and the countries to which they are sent.

Name the animals of Africa found in illustration and tell of the habits and peculiarities of each.

Inhabitants.

What part of Africa has been the home of the white race for ages?

What parts have been the home of the colored race?

What region is peopled with a mixed race?

In what ways do the various tribes of the equatorial regions differ?

Refer to colored plate and give location of the various tribes illustrated.

What is peculiar about the iron and copper money (see illustration) used by the native Africans? About their head-dress?

In what regions is the negro found? What of their civilization?

What sections of Africa have been settled by the following nations respectively: Great Britain, Portugal, Holland, France, Germany, Spain and Denmark?

What nation has been the most active in the settlement of Africa?

What classes of people do we find in Egypt? What of the civilization of Egypt?

What is the result of British control in northern Egypt?

What is the history of the Dutch in southern Africa?

Where was the first settlement? What was their object?

Later what two settlements did they make farther inland?

What were these people called? Between these people and what other nation did war result? What was the cause?

How does the population of Africa compare with that of the other continents?

Where is the principal European population found?

In what region is the race known as the pygmies found? What are their characteristics?

What country in Africa is the home for freed slaves? What part did the United States take in the establishment of this republic? After what American President was its capital named?

What work was accomplished by the king of Belgium in the Kongo State?

Give some facts about the progress along commercial lines made in this state due to the work of Stanley and King Leopold of Belgium.

Commerce and Cities.

To what extent did Stanley open up the Kongo River to commerce?

What are the principal obstacles to overcome in regard to river commerce of Africa?

What are the usual means of transporting goods from the interior?

What nations are particularly interested in central Africa?

What are some of the reasons why we may look for commercial developments in this section?

What means of transportation employed in the Sahara Desert?

What is the general nature of the trade of Africa?

What is the largest city of Egypt? How does it compare with Chicago? St. Louis?

Alexandria is the seaport of what country? What is its size and what are the exports from this city?

What are the exports of Cape Town? Algiers? Tunis? By what means is Cape Town connected with the interior?

By referring to the Cape-to-Cairo Railway map, what would you say is the length of this line? How does it compare in length with the Trans-Siberian Railroad? With the distance between New York and San Francisco?

Occupations.

Where is ostrich farming carried on? What is the value of this trade?

What occupations are followed in central Africa by the savages from which the outside world profits?

What can you say of the slave trade of Africa? What efforts have been made to suppress this?

In what sections of Africa is farming carried on? Mining? Trading? Stock-raising?

History.

What is said of the age of Egypt at the time the Roman empire was founded?

Was Egypt a prominent nation during Rome's zenith? What prevented the early exploration of the continent?

When and by whom was the Cape of Good Hope discovered? Who first sailed around it?

What additional accomplishment did Da Gama achieve twelve years later following the same course?

Was the continent circumscribed prior to the discovery of America?

What event led to the present interest in Africa?

When did Livingston begin his great work? How many years of his life did he dedicate to this work? When and where did he die? Who was delegated to follow up his work by the "Herald" of New York and the "Telegraph" of London? With what success?

Judging from the pyramids and tombs of Egypt, how many thousand years B. C. was this part of Africa inhabited?

Again, judging from the form of architecture and sculpture of that time, which were the more highly civilized, the people of those times or the people of some parts of interior Africa today?

Partitioning of Africa.

When and for what purpose was the African International Association organized?

Who established the Kongo Free State?

Through what congress were the present political divisions of Africa made?

Since what time has the political development of the continent been rapid?

What has been the effect of the Boer War on British influence in Africa?

What important enterprises have resulted from this influence?

What is its effect upon the native tribes?

Books of Africa.

"Through the Dark Continent."

"The Congo and the Founding of Its Free State," and "Darkest Africa," by Stanley.

"Missionary Travels and Researches in South Africa," by Livingston.

"The White Man's Africa," by Bacon.

Divisions

I. Mathematical Geography.
- 1. Form.
- 2. Size.
- 3. Motions.
- 4. Measurements.
- 5. Longitude and Latitude.
- 6. Zones.
- 7. Map.
- 8. International Date Line.

II. Physical Geography.
- 1. Land.
  - a. Continent.
  - b. Island.
  - c. Cape.
  - d. Peninsula.
  - e. Isthmus.
  - f. Mountain.
    - Range.
    - System.
    - Volcano.
  - g. Valley.
  - h. Plain.
  - i. Plateau.
- 2. Water.
  - a. Hydrography.
  - b. Ocean.
  - c. Gulf or Bay.
  - d. Strait.
  - e. Movements.
    - Currents.
    - Tides.
    - Waves.
  - f. River.
  - g. Lake.
- 3. Atmosphere.
  - a. Wind (map).
    - Chinook.
    - Monsoon.
    - Sirocco.
    - Kamsin.
  - b. Rainfall.
  - c. Storms.
    - Tornado.
    - Cyclone.
    - Hurricane.
  - d. Weather Bureau (map).
  - e. Relation of climate to life.

III. Political Geography.
- 1. Grand Divisions.
  - (See outline Africa.)
- 2. Countries.
  - (See outline United States.)
- 3. Minor political divisions.
  - (See outline California.)
- 4. Cities.
  - (See outline Boston.)
- 5. Forms of Government.
- 6. Religion.
- 7. Institutions.

IV. Economic Geography.
- 1. Industries.
- 2. Commerce.
- 3. Manufactures.
- 4. Agriculture.
- 5. Mining.

Pacific Ocean

Boundaries.	Size.	Islands.	Trade Winds.
North.	Compared with Atlantic.	Single.	Direction.
East.	All the continents.	Groups.	Duration.
South.	Lake Superior.		Names of.
West.	Your own state.		

TEST QUESTIONS ON THE PACIFIC OCEAN.

Who discovered the Pacific? When? What was its former name?

How does the size of the Pacific compare with that of the four continents? With North America? With the Atlantic?

What part of the earth's surface is occupied by this ocean?

Name and locate three important groups of islands.

In sailing from San Francisco to Manila, which island port would you visit? What distance is this from Manila?

Name six of the principal seas connecting with it.

If Mt. Everest were set down in the deepest part of it, how many feet of water would cover its summit?

What is the difference in the tides of the Pacific and Atlantic?

Why are the trade winds of the Pacific irregular?

Describe a typhoon. Trade winds.

Who were the first Europeans to enter the Pacific?

Name some countries and cities touched by the Pacific Ocean which late events have given importance.

Table showing a comparison of the countries of South America with themselves, with Germany, with our own country and with Illinois.

Similar outlines can easily and readily be made by teacher or pupil on other continents, on countries, states, etc.

Country.	Area in square miles.	Population in round numbers.	Population per square mile.	Miles of railroads.	Principal products. Name five of each country.
Germany	208,000	56,000,000	270	35,000	
United States..	3,000,000	76,000,000	25	299,000	
Illinois	56,000	5,000,000	90	12,000	
Argentina	1,113,000	4,800,000	4	11,460	
Bolivia	734,000	1,800,000	2	700	
Brazil	3,200,000	18,000,000	5	10,480	
Chile	280,000	3,100,000	11	2,880	
Colombia	504,000	3,900,000	7	500	
Ecuador	116,000	1,200,000	10	186	
Guiana, British.	109,000	300,000	2	104	
Guiana, Dutch.	46,000	67,000	1	...	
Guiana, French.	30,000	30,000	1	...	
Paraguay	157,000	600,000	3	156	
Peru	695,000	4,600,000	6	1,146	
Uruguay	72,000	2,400,000	12	1,210	
Venezuela	593,000	930,000	4	634	

TEST QUESTIONS.

How does the size and population of French Guiana compare with your own county? What percentage of Guiana's population are convicts?

If Brazil's population should suddenly increase five times how would it compare with that of the United States? Which has the larger area?

Which has more miles of railroad, Brazil or Illinois? Brazil or your own state?

If Illinois were no more thickly populated than Bolivia what would be its population?

How many South American countries have a smaller population than New York City? Than Boston? Than Seattle?

What products and industries of certain South American countries are common to your neighborhood?

Two-thirds of the world's supply of coffee comes from what country of South America?

Why are there so few railroads in Bolivia?

Were you to take a trip through Venezuela, what products would you see?

What countries are crossed by the equator?

For how many thousand miles is the Amazon and its tributaries navigable? How wide is it near its mouth?

What wild animals would you find in the Amazon country?

Which has the colder climate, Buenos Ayres or Chicago?

Where would you find whole armies of monkeys?

Which is the larger, Great Salt Lake or Lake Titicaca? At what great altitude is the latter located?

In what mountain range of South America are found the second highest peaks in the world?

In what countries are there no railroads?

From page illustrating animals of South America, what would you say are the chief uses of the alpaca? Of what bird in Africa does the rhea remind you? Which is the larger?

In what respect would you find the farms of Argentina similar to those of North Dakota?

With what language should you be familiar to understand and be understood in Montevideo? In Rio Janeiro? In Valparaiso?

Are there any monarchies in South America? What is the prevailing form of government?

Which would be the shady side of a street running east and west at midday in Valparaiso?

Why would you find no shade on either side of a street running east and west in Quito?

In what direction would you look to see the sun at Buenos Ayres?

Methods of Teaching Geography

I. Purposes of Teacher.
   1. To give knowledge.
      a. Immediate surroundings; why?
         Plants.
         Animals.
         Occupations, etc., etc.
      b. Principles and laws of geography.
         Climatic effects; what?
         Distribution of life; results?
      c. Application of laws.
         Determining what conditions?
      d. Observing these conditions.
         Control human activities; how? when?

II. Preparation of Teacher.
   1. Knowledge of what principles? Ability to apply how?
   2. Knowledge of what facts? Specific and general?
   3. Knowledge of methods of teaching.

III. Aids to Teacher's Preparation.
   1. Study of what works?
   2. Study of what related sciences?
   3. Supplementary reading; what? object?
   4. Observation; when, where and how?

IV. Equipment.
   1. Collections of what? For what? How used?
   2. Scrap cabinet. Consists of what? Purpose?
   3. Miscellaneous. Individual ideas.

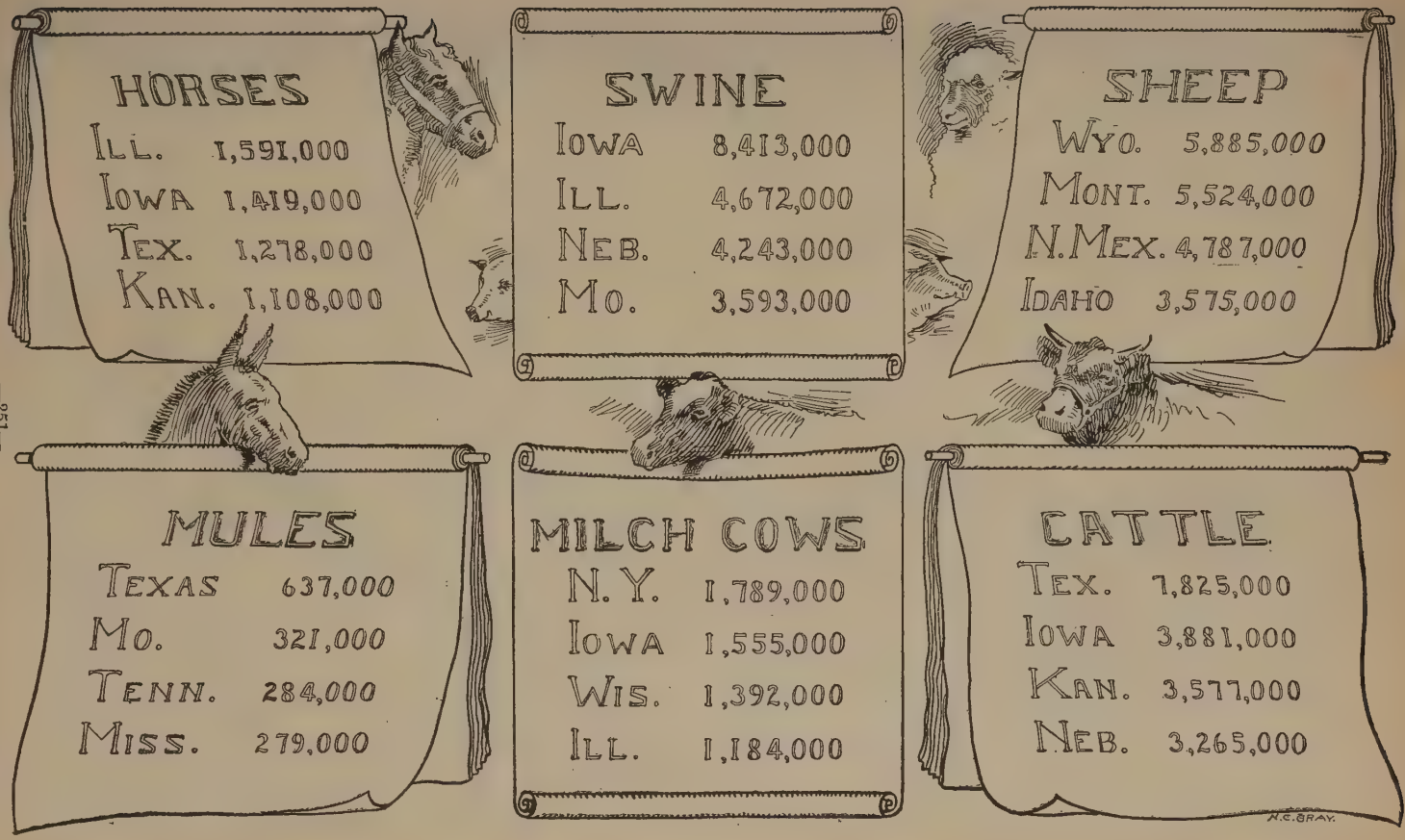
V. Grades.
   1. Primary.
      a. Nature study.
         What subjects?
         How presented?
      b. Facts and geographical conditions.
         Observation. What? How? Where?
      c. Towns.
         Occupations. What? Why?
         Transportation. What? Why?
      d. Maps. What? How presented?
      e. Travel.
         Imaginary journeys; object?
         Extending ideas; known to unknown.
   2. Intermediate.
      a. Text-book; adjustment of mind.
      b. Maps; of what? proportions?
   3. Grammar.
      a. Advanced text-book; how used?
      b. Reference work, etc.

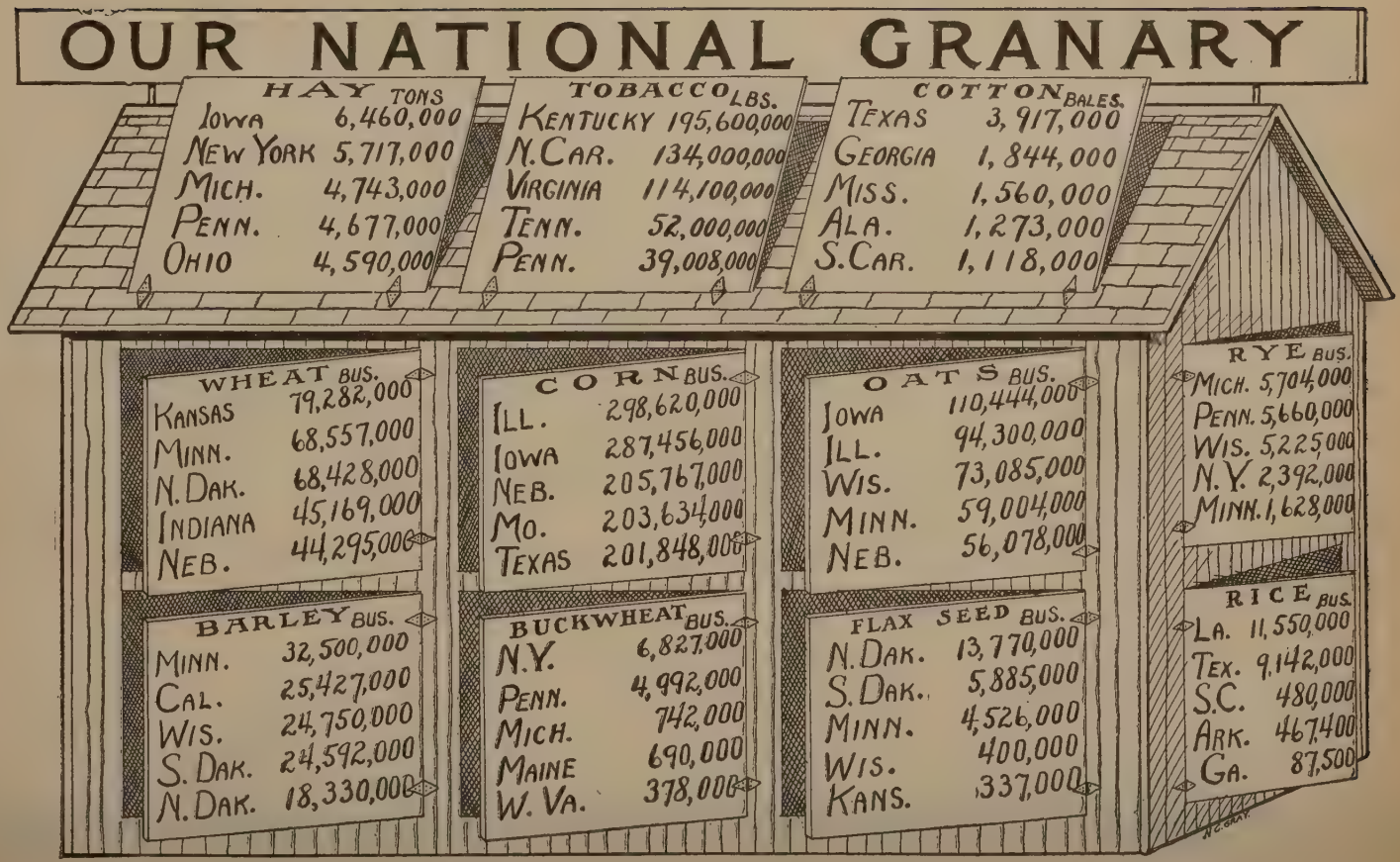
VI. General Aids, All Grades.
   1. Study of type. How? What?
      a. Comparisons.

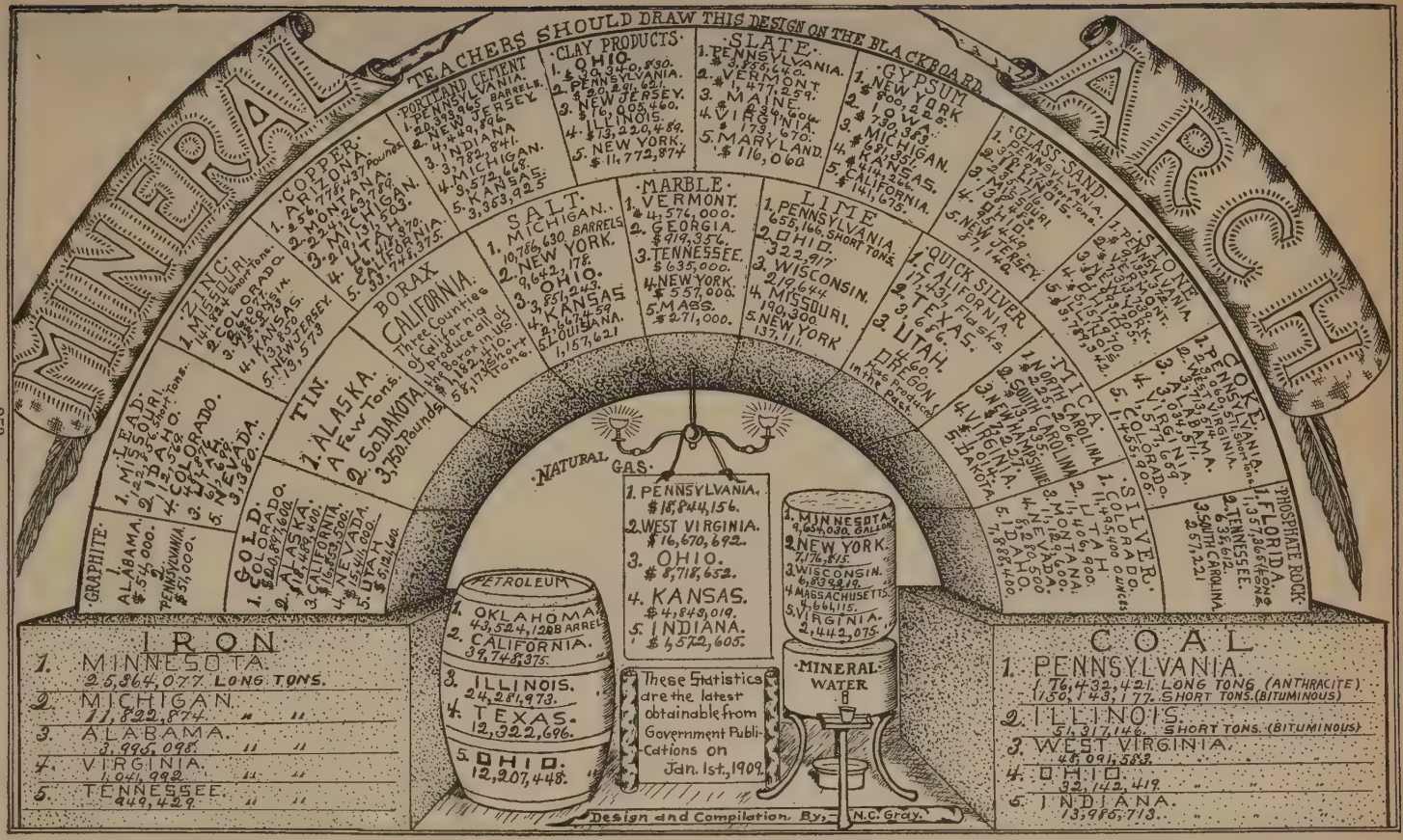
Forms or outlines.	Races of men.
Distances.	Animals.
Surfaces.	Occupations.
Drainage.	Civilization.
Climate.	Growth and decline.

Guard well your spare moments. They are like uncut diamonds. Discard them and their value will never be known; improve them and they will become the brightest gems in a useful life.

Every book is a good book that sets the reader in a working mood. The deep book, no matter how remote the subject, helps us best. —*Emerson.*


HORSES
ILL. 1,591,000
IOWA 1,419,000
TEX. 1,278,000
KAN. 1,108,000
SWINE
IOWA 8,413,000
ILL. 4,672,000
NEB. 4,243,000
MO. 3,593,000
SHEEP
WYO. 5,885,000
MONT. 5,524,000
N.MEX. 4,787,000
IDAHO 3,575,000
MULES
TEXAS 637,000
MO. 321,000
TENN. 284,000
MISS. 279,000
MILCH COWS
N.Y. 1,789,000
IOWA 1,555,000
WIS. 1,392,000
ILL. 1,184,000
CATTLE
TEX. 7,825,000
IOWA 3,881,000
KAN. 3,577,000
NEB. 3,265,000
H.C.BRAY.


OUR NATIONAL GRANARY
HAY TONS
Iowa 6,460,000
New York 5,717,000
Mich. 4,743,000
Penn. 4,677,000
Ohio 4,590,000
TOBACCO LBS.
Kentucky 195,600,000
N. Car. 134,000,000
Virginia 114,100,000
Tenn. 52,000,000
Penn. 39,008,000
COTTON BALES.
Texas 3,917,000
Georgia 1,844,000
Miss. 1,560,000
Ala. 1,273,000
S. Car. 1,118,000
WHEAT BUS.
Kansas 79,282,000
Minn. 68,557,000
N. Dak. 68,428,000
Indiana 45,169,000
Neb. 44,295,000
CORN BUS.
Ill. 298,620,000
Iowa 287,456,000
Neb. 205,767,000
Mo. 203,634,000
Texas 201,848,000
OATS BUS.
Iowa 110,444,000
Ill. 94,300,000
Wis. 73,085,000
Minn. 59,004,000
Neb. 56,078,000
RYE BUS.
Mich. 5,704,000
Penn. 5,660,000
Wis. 5,225,000
N.Y. 2,392,000
Minn. 1,628,000
BARLEY BUS.
Minn. 32,500,000
Cal. 25,427,000
Wis. 24,750,000
S. Dak. 24,592,000
N. Dak. 18,330,000
BUCKWHEAT BUS.
N.Y. 6,827,000
Penn. 4,992,000
Mich. 742,000
Maine 690,000
W. Va. 378,000
FLAX SEED BUS.
N. Dak. 13,770,000
S. Dak. 5,885,000
Minn. 4,526,000
Wis. 400,000
Kans. 337,000
RICE BUS.
La. 11,550,000
Tex. 9,142,000
S.C. 480,000
Ark. 467,400
Ga. 87,500


MINERAL
TEACHERS SHOULD DRAW THIS DESIGN ON THE BLACKBOARD.
ARCH
GRAPHITE.
1. ALABAMA. $54,000.
2. PENNSYLVANIA. $51,000.
GOLD.
1. COLORADO. $20,869,700.
2. ALASKA. $14,448,400.
3. CALIFORNIA. $10,455,200.
4. NEVADA. $4,411,000.
5. UTAH. $518,100.
TIN.
1. ALASKA. A Few Tons.
2. So. DAKOTA. 3,750 Pounds.
LEAD.
1. MISSOURI. 238,000 Short Tons.
2. IDAHO. 113,578
3. COLORADO. 37,144
4. UTAH. 33,669
5. NEVADA. 3,380.
ZINC.
1. MISSOURI. 141,824 Short Tons.
2. COLORADO. 30,000
3. KANSAS. 19,345
4. NEW JERSEY. 19,800
5. UTAH. 18,573
COPPER.
1. ARIZONA. 376,437 Pounds.
2. MONTANA. 263,789,
3. MICHIGAN. 94,263,
4. UTAH. 44,870,
5. CALIFORNIA. 33,744,375.
BORAX.
CALIFORNIA.
Three Counties in California Produce all the Borax in U.S.
1,182,410 Short Tons.
5,873,180 Short Tons.
PORTLAND CEMENT
1. PENNSYLVANIA. 20,399,965 BARRELS.
2. NEW JERSEY. 4,449,896
3. INDIANA. 3,782,841.
4. MICHIGAN. 3,572,668.
5. KANSAS. 3,363,925.
CLAY PRODUCTS.
1. OHIO. $20,340,830.
2. PENNSYLVANIA. $20,281,681.
3. NEW JERSEY. $16,005,460.
4. ILLINOIS. $13,220,489.
5. NEW YORK. $11,772,874
SALT.
1. MICHIGAN. 10,786,630 BARRELS
2. NEW YORK. 9,642,178
3. OHIO. 3,851,243.
4. KANSAS. 2,167,459
5. LOUISIANA. 1,157,621
MARBLE.
1. VERMONT. $4,574,000.
2. GEORGIA. $919,356.
3. TENNESSEE. $635,000.
4. NEW YORK. $557,000.
5. MASS. $271,000.
SLATE.
1. PENNSYLVANIA. $3,555,440.
2. VERMONT. $1,477,259.
3. MAINE. $ 284,600.
4. VIRGINIA. $ 173,670.
5. MARYLAND. $ 116,060
LIME
1. PENNSYLVANIA. 655,166 SHORT TONS.
2. OHIO. 322,917
3. WISCONSIN. 219,644
4. MISSOURI. 190,300
5. NEW YORK 137,111
GYPSUM
1. NEW YORK. $ 900,228.
2. IOWA. $ 730,363.
3. MICHIGAN. $ 691,351.
4. KANSAS. $ 414,234.
5. CALIFORNIA. $ 141,615.
QUICK SILVER
1. CALIFORNIA. 17,431 Flasks.
2. TEXAS. 3,666.
3. UTAH. 1,460.
4. OREGON. In the Past.
GLASS SAND.
1. PENNSYLVANIA. 1,775,116 Tons.
2. ILLINOIS. 1,775,116
3. OHIO. 1,775,116
4. MISSOURI. 1,775,116
5. NEW JERSEY. 1,775,116
STONE
1. PENNSYLVANIA. $ 13,787,342.
2. VERMONT. $ 3,000,000.
3. OHIO. $ 2,000,000.
4. NEW YORK. $ 1,500,000.
5. INDIANA. $ 1,000,000.
MICA.
1. NORTH CAROLINA. 225,000 lbs.
2. SOUTH CAROLINA. 200,000
3. NEW HAMPSHIRE. 100,000
4. VIRGINIA. 50,000
5. DAKOTA. 25,000
COKE.
1. PENNSYLVANIA. 15,000,000 Short Tons.
2. ALABAMA. 1,000,000
3. VIRGINIA. 1,000,000
4. COLORADO. 1,000,000
5. OHIO. 1,000,000
SILVER.
1. COLORADO. 11,445,400 OUNCES
2. UTAH. 7,169,900.
3. MONTANA. 6,600,000
4. NEVADA. 4,620,500
5. IDAHO. 4,188,400.
PHOSPHATE ROCK.
1. FLORIDA. 1,357,386 LONG TONS
2. TENNESSEE. 336,612.
3. SOUTH CAROLINA. 257,221
NATURAL GAS.
1. PENNSYLVANIA. $18,944,156.
2. WEST VIRGINIA. $16,670,692.
3. OHIO. $ 8,718,632.
4. KANSAS. $ 4,843,019.
5. INDIANA. $ 1,572,605.
PETROLEUM
1. OKLAHOMA. 43,524,128 BARRELS
2. CALIFORNIA. 39,748,375.
3. ILLINOIS. 24,281,973.
4. TEXAS. 12,322,696.
5. OHIO. 12,207,448.
1. MINNESOTA. 9,634,020. GALLONS
2. NEW YORK. 7,176,815.
3. WISCONSIN. 6,839,919.
4. MASSACHUSETTS. 4,661,115.
5. VIRGINIA. 2,442,075.
MINERAL WATER
These Statistics are the latest obtainable from Government Publications on Jan. 1st, 1909.
IRON
1. MINNESOTA. 25,864,077 LONG TONS.
2. MICHIGAN. 11,822,874 " "
3. ALABAMA. 3,995,098 " "
4. VIRGINIA. 1,041,992 " "
5. TENNESSEE. 949,429 " "
COAL
1. PENNSYLVANIA. 176,432,421 LONG TONS (ANTHRACITE)
130,143,177 SHORT TONS (BITUMINOUS)
2. ILLINOIS. 51,317,146. SHORT TONS. (BITUMINOUS)
3. WEST VIRGINIA. 45,091,583. " " "
4. OHIO. 32,142,419 " " "
5. INDIANA. 13,986,713. " " "
Design and Compilation By,— N.C. Gray.

From my infancy I was passionately fond of reading, and all the money that came in my hands was laid out in the purchase of books.
—*Benjamin Franklin.*

Geology

In our general article on Geology in THE NEW PRACTICAL REFERENCE LIBRARY we treat of the origin of the earth, the formation of rocks, classes of rocks, the periods of geologic history, the so-called systems into which these periods are divided, and the present geological forces which are causing changes in the earth. From this article there are references to each of the twenty-eight periods and systems mentioned in the article; also to the articles on PHYSICAL GEOGRAPHY, DIKE, DIP, FOSSIL, FAULT, JOINT, which describe in more detail many of the features mentioned in the general article, GEOLOGY. The department also contains about 200 articles on mineralogy, including all the important rocks and earths, and some articles upon special phases of the subject, such as GEOLOGICAL SURVEY OF THE UNITED STATES, GLACIER, FOSSIL, MAMMOTH, ORE, PALEONTOLOGY, and an article on MINERALOGY.

OUTLINE.

I. DEFINITION.
II. THEORIES OF ORIGIN OF EARTH.
III. FORMATION OF ROCKS.—Key to all life before man.
  1. Igneous Rocks—Caused by heat.
  2. Stratified Rock—Caused by action of water.
  3. Metamorphic Rocks—Those whose original composition has been altered on account of heat, chemical action, moisture or pressure.
IV. GEOLOGIC PERIODS.
  1. Length or Extent.
    a. Determined by studying the fossils found in different stone formations.
  2. Object.
    a. To trace the development of vegetable and animal life by means of fossils of each stone period.
  3. Names.
    a. Azoic or Archean—Forming of igneous rocks.
      No form of animal life.
    b. Protozoic—Rock formations—granite, marbles, slates.
      Lowest forms of life appear as fossils.
    c. Paleozoic—Appearing of continents.
      Formation of coal measures.
      Rich vegetation—age of coal plants.
      Development of life from lowest forms to vertebrates.
      Age of fishes, insects, scorpions, amphibians.

d. Mesozoic—Formation of sandstone, chalk beds, gold, etc.
Vegetation—Great variety, trees resembling our oak, birch, poplar, etc.
Animals—Great variety, flying birds, reptiles, etc.

e. Cenozoic—Continents nearly as they are now.
Birds, mammals (milk-givers), etc.
Snow, floods, ice, formation of caves.
Age of man.

V. Biographies of Geologists.

Agassiz.	Dawson, J. W.	Hitchcock.	Murchison.	Smith.
Buckland.	Darwin.	Lamarck.	Owen.	Strabo.
Buffon.	Dana.	Le Conte.	Powell.	Thomson.
Cuvier.	Geikie.	Lyell.	Pythagoras.	Tyndall.
Dawson, G. M.	Hayden.	Miller.	Silliman.	Winchell.

QUESTIONS ON GEOLOGY.

What is geology? What is now the accepted theory as to the origin of the earth?

What proof have we that the interior of the earth is hot? Were the rocks of your neighborhood formed through the action of heat or water? Why your answer? What causes an earthquake? A volcanic eruption?

By a study of the colored plate of precious stones, what similarity do you see between the diamond and the opal? The turquoise? The amethyst?

What makes a hillside uneven and rough? What causes canyons?

Where does the soil come from? What is it? How formed?

Since the earth is being constantly worn down, what prevents it from being entirely immersed in the sea?

What is the difference between geology and mineralogy?

What are the seven varieties of marble? What is the difference between marble and granite?

What are some of the causes of the changes in the earth's crust at present? Cite some instances of change.

What are the uses of marble? Granite?

How is quartz used in the manufacture of porcelain?

What is amalgam?

What are some of the theories regarding the nature of the earth's interior?

How much fuel is required to smelt a ton of iron? How many hundred tons of coal per day is required to run a modern steamship? How many thousand tons to make a voyage across the Atlantic?

What is stratified rock?

By what means do we know the form of plant or animal life existing before man?

Which existed first, animals or plant? How do we know?

What is a quarry?

What is the difference between coal and diamonds?

What is the action of frost on rocks? What is the action of rain? Why?

What is the origin of the hills and mountains?

Where are the stratified rocks generally found?

What effect does ice have on rocks? Air?

Why do we sometimes find single rocks weighing many tons located on level farm lands?

How do waves change the seashore? What properties has water that it is able to decompose rocks?

What is a glacier? Where found? How formed? With what rapidity do they move? What effect would they have on surface?

What was the glacial period? What effects did it have on the earth?

What is the largest actual sum paid for a diamond? At what price is the stone now valued?

Of what element is the diamond the purest form?

For what do mining engineers use diamonds? Copperplate engravers?

What was the weight, cut and uncut, of the famous Koh-i-noor diamond? What is the remarkable size of the Cullianan diamond found in 1905?

Are watch cases generally of pure gold? Give reasons for answer.

How does the ruby compare in value with the diamond? The emerald?

Where and how are pearls obtained?

For what are you indebted to graphite every time you pick up your pencil to write?

What is onyx? Where is it found? What have you in your home made from it?

CORRELATED SUBJECTS: Physical Geography; Dike; Dip; Fossil; Fault; Valley; Joint; Metamorphism; Erosion; Nebular Typothesis; Glacier; Periods and Systems of Time; Canyon.

Gold

KINDS.
- Pure gold
- Jewelers' gold
- Gold for coinage

DISTRIBUTION IN UNITED STATES.
- California
- Colorado
- Dakota
- Idaho
- Montana
- Nevada
- Alaska

GOLD FIELDS.
- Australia
- Peru
- Bolivia
- Ural Mountains
- New Zealand
- British Columbia
- Klondike
- South Africa

TEST QUESTIONS ON GOLD.

What is gold? What is its value compared with silver? With copper? With brass?

To what remarkable thinness can it be beaten?

Would a wire made from an ounce of gold stretch from New York City to Des Moines?

How much heavier is gold than water? Than silver?

How does the production of gold in the United States compare with the value of the wheat crop? With the corn crop? The cotton crop?

How many carats denote pure gold?

How much copper is used in gold coinage?

Gold jewelry is made of what degree of fineness?

In what parts of the world is gold found? How is it obtained?

How is it extracted from sand and gravel?

Where was the chief supply of gold found before the discovery in California?

What was the year of the gold fever in California?

Is gold found in any of the United States besides California?

How many hundred million dollars does the annual production of gold amount to?

When were the Gold Fields of Australia opened?

What kind of gold do dentists use in filling teeth?

What is the earliest record before Christ of gold beating? Was the art known to Homer?

What do gold beaters mean by a "cutch"?

How many hours must gold be beaten before it will spread out?

Iron

I. Properties.
   1. Ductility.
   2. Malleability.
   3. Hardness (tempering).
   4. Magnetism.

II. Impurities.
   1. Carbon.
   2. Silicon.
   3. Sulphur.
   4. Phosphorus.

III. Compounds.
   1. Oxides.
   2. Sulphides.
   3. Chloride.
   4. Hydrates.

IV. Ores.
   1. Kinds.
      a. Red hematite.
      b. Brown hematite.
      c. Magnetite.
      d. Spathic.
   2. Distribution.
      a. United States.
         Pennsylvania.
         Virginia.
         Adirondack Mts.
         Lake Superior regions, etc.
      b. Foreign Countries—Russia, England, Germany, Canada, Austria, Spain, Scandanavia.

V. Mining Ore.
   1. Methods.
      a. Blasting. Ore in form of ledge.
      b. Steam shovel. When ore is soft.
   2. Shipping.
      a. Methods of loading and unloading ore vessels.
      b. Ports.
   3. Smelting—Object.
      a. Crusher.
      b. Blast furnace.
      c. Manner of tapping, cooling, etc.

VI. Pig Iron.
   1. Characteristics.
      a. Rough.
      b. Coarse.
      c. Brittle.
   2. Uses.
      a. Iron castings—Stoves, framework, etc.

VII. Wrought Iron.
   1. Characteristics.
      a. Soft.
      b. Flexible.
      c. Ductile.
      d. Malleable.
   2. Uses.
      a. Nails, wire, etc.

VIII. Steel.
   1. Characteristics.
      a. Tough.
      b. Hard.
      c. Tenacious.
      d. Gray in color.
   2. Uses.
      a. Framework of large buildings.
      b. Bridges.
      c. Steel rails and ties.
      d. Watches—Mainsprings, etc.

IX. History of the Industry.
   1. Ancient—Egyptians, Assyrians, Babylonians, Romans, Greeks, Iron Age.
   2. Modern.
      a. United States ranks how?
      b. England ranks how?
      c. Germany ranks how?

X. Uses of Iron in Medicine.
   1. Blood purifier.
   2. Stimulates digestion.

QUESTIONS.

What is iron? Why are steel plants generally built near extensive coal beds?

Why does iron rust easily? What is rust? What kind of iron in your kitchen range?

Is there any other known metal that could be used for the same purposes as iron?

Which could you do without the better, gold or iron? Which constitutes the greatest factor in the world's progress?

Who was Krupp? Bessemer?

Why is coke used for blast furnaces?

What is slag? To what practical uses is it put?

Distinguish between pig iron, cast iron, wrought iron and steel. Name articles made from each.

What effect do repeated smeltings have on iron?

What can you say of the following: Carnegie, Schwab, Frick, Gates, etc.?

How did they handle iron in the iron age? What are some of the new uses of steel?

How much heavier is iron than water? For what purpose is pure iron used?

What is the name of the one continent which has no iron supply? Where is the best iron found in Europe?

How does the United States stand in the production of iron ore?

What is the method of mining iron ore?

How are the impurities separated from the iron?

How is a blast furnace operated?

In what is the molten iron cooled?

What does it cost per ton to transport iron from Duluth to Cleveland or adjoining ports?

EARLY USE OF IRON.

Note.—It has been a popular belief that iron was little known to the ancients, but Lepsius believes that the Egyptians used it for hand instruments, and that it was prepared in smelting furnaces 3000 B. C.

An iron band was found in an inner part of the Pyramids of Cheops, where the ancient architect had placed it not later than 2800 B. C.

In the tombs of Thebes and Memphis tools and other articles of iron have been found, some of which are among the treasures of the New York Historical Society.

Iron was so valued that it was seized as plunder by the victorious soldiers. An iron sickle was found beneath one of the sphinxes at Karnak, and iron was used for the door frames of the temple of Ptah. A piece of pure iron was found beneath the obelisk that now stands in Central Park, New York, when it was taken from its original position on the banks of the Nile.

The relics found show that the art of tempering was known at an early date. The Egyptians worked mines in the desert region of the south between the Nile and the Red Sea, and also near Mount Sinai in Palestine. The ruins of extensive iron works were found in 1873 near the Wells of Moses.

What makes steel valuable?
What is pig iron used for? Wrought iron?
When did iron come into general use?
Where in the Bible is the first reference to iron?
When was iron discovered in the United States?
When were the first iron works built in the United States?
Who introduced the use of anthracite coal for smelting?
What country leads the world in the iron and steel manufacture?
Which country is next in line?
How much fuel is required to smelt a ton of iron?
How is iron used in medicine? What effect does it have on the health?
What is meant by the "iron age?"
What is the leading iron-producing state?
Correlated subjects—Blast furnaces, steam shovel, rolling mills, Bessemer steel, flux.

Mining

I. Definition.
  1. Mining proper.
  2. Metallurgy.
    a. Separating metals from their ores.
II. Deposits.
  1. Beds or seams.
  2. Veins or lodes.
III. Machinery.
  1. For beds or seams of ore, shaft is sunk.
  2. For veins or lodes, vertical shaft is sunk.
  3. Sinking of shafts.
    a. Blasting, etc.
    b. Drill of steel driven by steam or electricity.
  4. Machinery for hoisting, crushing, separating, etc., dependent on kind of mines.
IV. Work Inside of Mine.
V. Shipping.
Correlated subjects: See All Metals.

MINING.

Gold.

(Also see Outline.)
How many carats fine is pure gold? Jewelers' gold? Standard gold for coinage?
Why is it necessary to combine gold with some other metal before using? What is the baser metal called?
Are watch cases generally of pure gold? Give reasons for answer. How does the United States rank as a gold producing country?
In what condition is gold found, and where? What other metals does gold unite with to form an alloy?
Describe processes of separating gold from its impurities. By whom are the assay offices established, and where?

Silver.

Give uses of silver. Is it ever used as a medicine?
What are its characteristics? What effect has the air upon it?
Where are the silver mines of the United States, Mexico, and South

America? What percentage of the world's supply does the United States produce?

With what other ores does silver readily unite?

What is meant by the standard silver dollar? When did this come into use?

Copper.

In what forms does copper occur in the earth and what other metals are found in copper ore?

What percentage of the world's supply does the United States produce, and where are the important copper producing sections?

Give processes of extracting copper from the ore.

An important use of copper is in connection with what industry?

What are some of the household uses of copper?

Iron.

(See outline.)

Lead.

What are some of the characteristics of lead? What other metals are sometimes obtained from lead ore?

What is white lead and for what is it used?

Give practical uses of lead along all lines. What is lead poisoning?

Why is lead so expensive?

What country stands first in the production of lead?

Sulphur.

Describe sulphur. What form does it take as a mineral?

In what regions is it generally found?

What percentage of the supply of sulphur is made into sulphuric acid? What are the uses of this acid?

How is sulphur used as a medicine? As a household help?

What country leads in the production of sulphur?

Coal.

In what position or form is coal found in the earth? Why do we know coal is of vegetable origin?

By what means is it reached?

What is meant by the term "firedamp?" How is a coal mine ventilated?

Where are the principal coal mines of the world?

What do you know of the miners and their lives? Who is John Mitchell?

Always read the preface to a book. It places you on a vantage ground and enables you to survey more completely the book itself.

In science, read by preference the newest books; in literature, the oldest. The classic literature is always modern. —*Bulwer-Lytton.*

Coal

I. Formation.
   1. Decayed vegetation.
      a. Pressure.
      b. Heat.
   2. Upheavals and depressions.
   3. Coal measures.

II. Varieties.
   1. Anthracite.
   2. Bituminous.
      a. Cannel.
   3. Lignite.

III. Distribution.
   1. Europe.
   2. Asia.
   3. Africa.
   4. America, etc.

IV. Production.
   1. United States.
   2. Great Britain.
   3. Germany, etc.

V. History of the Industry.

FORMATION.

What is coal?

How is it formed? What kind do you use in your home?

How are the veins separated from one another?

What means have we of knowing the sort of vegetation from which coal was formed?

How is it possible to know the number of upheavals and depressions which took place in the formation of the coal?

What is meant by the coal measures?

What did the vegetation of the coal period include?

What was the height of the ferns?

VARIETIES.

According to its hardness how is coal divided?

Which is the best variety of coal? Is it found near the surface or deep in the earth?

Where are the largest mines of this variety? For what is it generally used?

Does it produce smoke in burning?

Which variety is known as soft coal?

What causes the dense black smoke in burning soft coal?

Where are the great fields of this coal found? What are its important uses?

Describe cannel coal. For what is it especially desirable? Why is it very expensive?

Where is lignite coal found? How does it compare in age with other varieties?

Why is it useless for manufacturing purposes? In what state is it valuable for fuel?

DISTRIBUTION.

What are the leading coal producing countries of Europe?

Which country has the most extensive fields?

What country in Asia is supposed to have the most extensive coal fields in the world? What about their development?

What part of Africa contains coal fields?

Tell about the coal fields of Australia and the neighboring islands.

One hour a day profitably employed in reading would enable any person of ordinary capacity to master a complete science. One hour a day would make an ignorant man a well informed man in ten years.

History

History, in the true sense of the word, is a great deal more than mere dates and names; it is more than a fascinating story, since it fills the reader with reality. Take, now, your school history and supplement the lessons which it contains with readings from The New Practical Reference Library, and the dull, dry parts will become illuminated and the task of your study periods will develop into a recreation.

In The New Practical Reference Library is a general article on History, in which the three meanings of the term are described: history as a subject of study, history as a branch of science, and history as a branch of literature. Under the first head the spirit, content or meaning of history is shown; under the second, the materials with which historians deal and the methods by which they work are described. The division of history into periods, ancient, medieval and modern, is also discussed. Under the last head a list of the principal histories, from the time of Herodotus to that of Rhodes, is given. A reference in this article is made to the article History—Methods of Teaching, which follows it.

In the article History—Methods of Teaching, the purposes of historical instruction are named, with suggestions as to the time and place for emphasizing each of them; the preparation of the teacher is discussed and, finally, specific methods of teaching history in the primary grades, intermediate grades, and grammar grades are described, including lists of books peculiarly adapted to the work of each of these grades and for the assistance of the teacher.

The history of each nation is given in a subhead of the article upon that nation. These subdivisions contain numerous references to the histories of other nations, as well as to other articles upon important wars, battles, political events of sufficient importance to be known by distinctive names, such as Congress of Vienna, Barebones Parliament, and others; treaties; famous documents; temporary systems of government, such as the commonwealth and the directory; great institutions, such as the feudal system and chivalry, and important special periods, such as the Dark Ages, the Middle Ages, etc. Frequent reference is also made to the biographies of famous individuals, and in a few cases general discussions of the periods in which they lived are given under their names; this is true of Napoleon and Cromwell. The history of the United States from the discovery of America is contained in a long article which forms a subdivision of the article United States. This is subdivided by periods and contains frequent references to a great many other articles, such as those upon battles and wars, famous laws, treaties, congresses, documents and organizations. Among these titles are such as the following: The Alabama; Albany Convention; Antietam, Battle of; Anti-Federalists; Bacon's Rebellion; Bering Sea Controversy; Black Friday; Bon Homme Richard; Boston

Massacre; Carpet-Baggers; Charter Oak; Chinese Exclusion Act; Cincinnati, Society of the; Clayton-Bulwer Treaty; Confederate Veterans, United; Congressional Record; Coxey's Army, etc. The article upon each of the states contains a comparatively brief history of the state. The department of American biography is exceptionally large. Reference is made to it from almost every historical article. Under the name of each president the principal events of his administration are enumerated.

OUTLINE.

I. General Article.
   1. As a subject of study.
   2. As a branch of science.
   3. As a branch of literature.

II. History, Methods of Teaching.
   1. Purposes.
   2. Preparation of the teacher.
   3. Primary grades.
   4. Intermediate grades.
   5. Grammar grades.

III. Foreign History.
   1. Ancient.
   2. Medieval.
   3. Modern.
   4. National—Under titles of nations.
   5. Most important wars and battles—In separate articles.
   6. Important political events, such as treaties, congresses, documents, systems of government, institutions and periods—In separate articles.
   7. Biographies.

IV. United States History.
   1. General article—In article United States.
   2. State histories—Under separate states.
   3. Battles and wars.
   4. Political events, such as laws, treaties, congresses, documents and organizations.
   5. Biographies.

Ancient—476 A. D. (Before the fall of Rome.)
   Assyria and Babylonians.
   Egypt—Geography of, Nile.
   Hebrews—Israelites or Jews.
   Persians—Fall of, Cyrus, Cambyses.
   Greece—Pericles, Alexander the Great, Macedonian Empire, Xerxes.
   Rome—Cincinnatus, Gauls, Carthage, Triumvirs.
   Barbarian tribes.

Medieval—476 A. D.—Sixteenth century. (From Rome to America.)
   Saracens—Mohammed, Hegira, Koran.
   Italy—Lombardy.
   Byzantine Empire—Justinian, The Greek Church.
   France—Charlemagne.
   Germany—Invention of printing.
   Spain—Castile and Aragon, Grenada.
   Portugal—Prince Henry, Diaz, Vasco da Gama.
   England—Teutons, Alfred the Great, William the Conqueror.

MODERN—Sixteenth century. (Down to modern times.)

England—Elizabeth, Stuarts, Ireland, Victoria, Gladstone.
France—Louis XV.
Germany—Luther, Reformation.
Scandinavia—Christian II., Gustavus, Ivan.
Italy—Papacy, Cæsar, Raphael.
Spain and Portugal—Philip II., Inquisition, Armada.
Russia—Peter the Great.
America—United States, Mexico, Cuba.

I. MEANING.
   1. Events, forces and institutions denoting a nation's character and progress.
      a. Social.
      b. Industrial.
      c. Intellectual.
      d. Religious.
      e. Political.
      f. Influence of individuals.
   2. Science which studies these conditions.
      a. Ruins, buildings, implements.
      b. Laws and documents regarding government.
      c. Art and literature.
      d. Contemporary writings.
   3. Branch of literature in which these conditions are discussed.
      a. Earliest and greatest writings—Myths, traditions, etc.; valued for their literary merit rather than historical facts.
      b. Modern writings—Narration and search of truth without partiality.
      c. Other social sciences based upon it in regard to data, etc.

II. DIVISIONS.
   1. Ancient—
      a. Struggle toward universal unity in thought, politics and religion.
      b. From primitive times to Charlemagne.
   2. Medieval—
      a. Confusion of ancient ideals of universal unity and supplanted by extreme individualism.
      b. Extended to middle of fifteenth century, Fall of Constantinople.
   3. Modern—
      a. Idea of nationality carried into all questions.
      b. Up to present time, including United States history.

QUESTIONS—MONROE DOCTRINE.

What is the Monroe Doctrine?
Under whose administration was it formulated?
What led to its formation?
When was this doctrine first invoked, and against whom?
When and for what reasons was the doctrine once disregarded?
What did this finally bring about for the benefit of the United States?
When did Mexico benefit greatly by it?
What was President Hayes' stand in regard to its enforcement? President Cleveland's?

Ancient History

There is no study so conducive to culture as the study of history. It is sometimes very hard for a person to get a general survey of the entire subject of general history and to take up the study in a systematic and knowing way. For this reason we have portrayed this entire subject in a series of pen sketches which we believe will create an interest in this valuable study and will encourage deeper research on the part of the student.

Just a casual glance at our sketch of Egypt acquaints you with many of the interesting features in connection with the earliest civilization. The pyramids and sphinx, the Nile, Rameses, hieroglyphic writing, the desert, the camel and the mummy are immediately impressed on the student's mind, and this prepares him for the study of this country, following out the chronological summary as outlined. If a person but familiarizes himself with these summaries he will be acquainted with the great events of history.

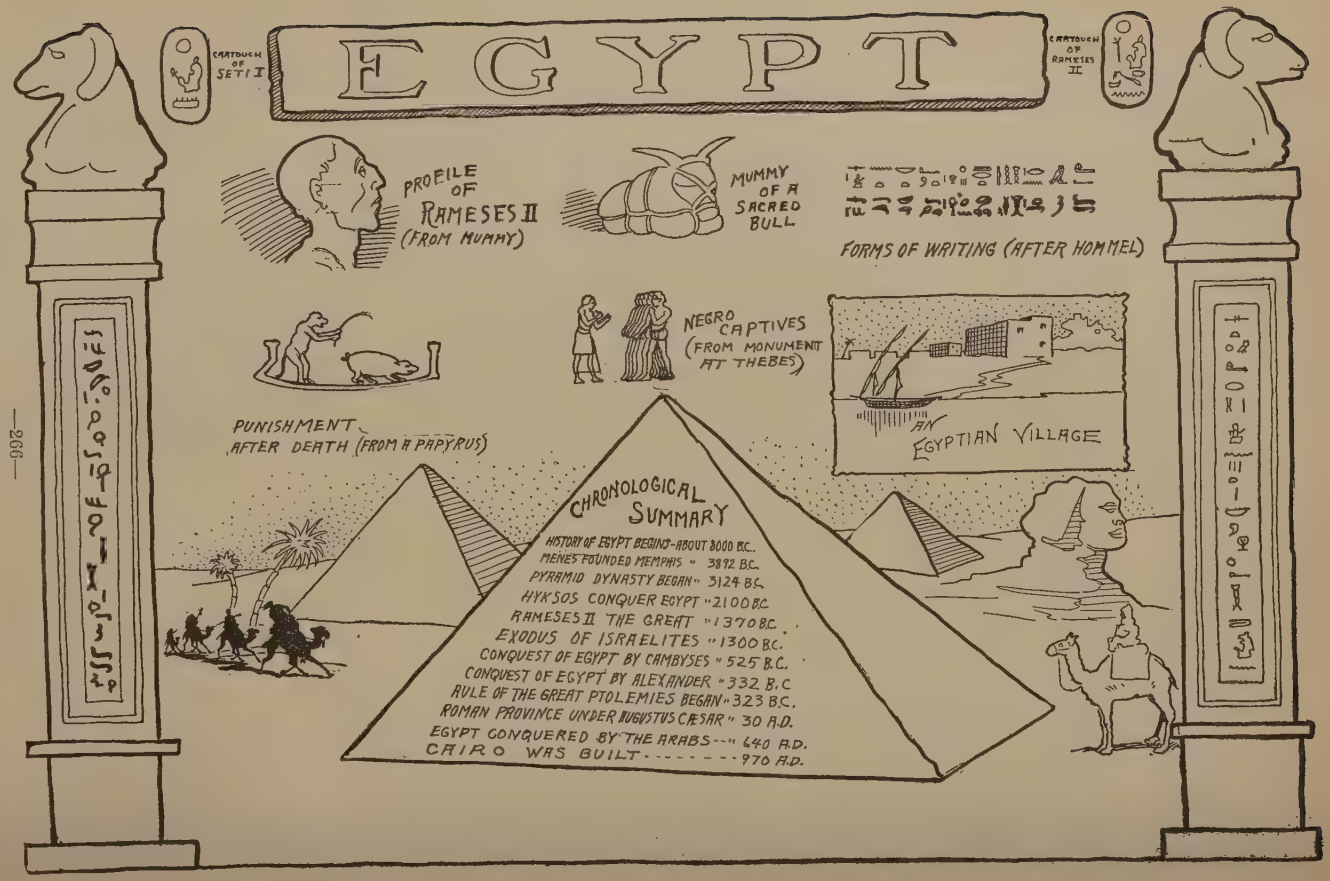
This is followed with a characteristic sketch of China and other ancient nations. In the Hebrew sketch even our very suggestive border furnishes a fruitful study.

Grecian history is depicted on three charts, each representing a special period, the first representing the Heroic period, covering three hundred years of early history. We then show the period of Glory and this is followed by a chart on the Decline, represented by its characteristic figure of the mourning Athena. In Greek civilization we are told that "in all that pertains to beauty of form, nicety of language and subtlety of thought, the ancient Greeks are still our masters and teachers."

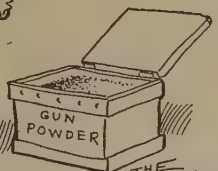
The entire history of Rome is also shown by three separate pen sketches. In the first sketch we have the Legendary chart, showing its early history. This is followed by the Republic, established in 509 B. C., and Rome as an Empire. In addition we supply you three special charts, one on Roman civilization, another showing social customs and the last on the Eternal City. A characteristic of this chart is the ten noms de plume as shown in the border. Our two charts showing Mohammedanism and mythology complete the series on ancient history. We trust this series will be the means of interesting many in the fruitful study of hitsory.

LIST OF PEN SKETCHES.

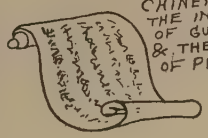
Egypt.
China.
Chaldea—Persia—Assyria.
The Hebrews.
Greece—Heroic Period.
Greece—Period of Glory.
Greece—Period of Decline.
Greece—Civilization.
Rome—Legendary Period.
Rome—The Republic.
Rome—The Empire.
Roman Civilization.
Rome—Social Customs.
The Eternal City.
Mythology.
Mohammedanism.

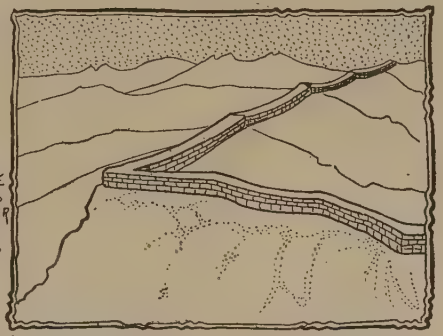

EGYPT
CARTOUCH OF SETI I
CARTOUCH OF RAMESES II
PROFILE OF RAMESES II (FROM MUMMY)
MUMMY OF A SACRED BULL
FORMS OF WRITING (AFTER HOMMEL)
NEGRO CAPTIVES (FROM MONUMENT AT THEBES)
PUNISHMENT AFTER DEATH (FROM A PAPYRUS)
AN EGYPTIAN VILLAGE
CHRONOLOGICAL SUMMARY
HISTORY OF EGYPT BEGINS-ABOUT 8000 B.C.
MENES FOUNDED MEMPHIS " 3892 B.C.
PYRAMID DYNASTY BEGAN " 3124 B.C.
HYKSOS CONQUER EGYPT " 2100 B.C.
RAMESES II THE GREAT " 1370 B.C.
EXODUS OF ISRAELITES " 1300 B.C.
CONQUEST OF EGYPT BY CAMBYSES " 525 B.C.
CONQUEST OF EGYPT BY ALEXANDER " 332 B.C.
RULE OF THE GREAT PTOLEMIES BEGAN " 323 B.C.
ROMAN PROVINCE UNDER AUGUSTUS CÆSAR " 30 A.D.
EGYPT CONQUERED BY THE ARABS--" 640 A.D.
CAIRO WAS BUILT ---------- 970 A.D.

CHINA



THE CHINESE WERE THE INVENTORS OF GUN POWDER & THE ART OF PRINTING





-THE GREAT WALL OF CHINA-

PI-YUNG-KUNG-HALL OF THE CLASSICS WHERE ARE KEPT THE REMAINS OF THE ANCIENT CHINESE LITERATURE

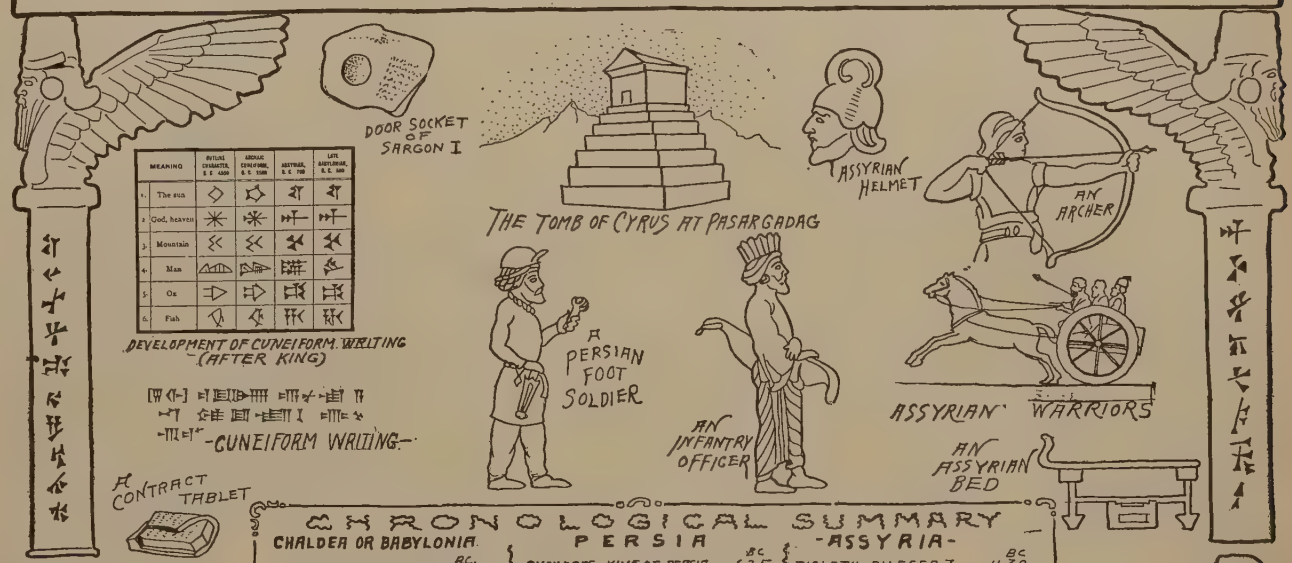
A MANDARIN.

TRADITIONAL LIKENESS OF CONFUCIUS

CHRONOLOGICAL SUMMARY

MIGRATION OF CHINESE FROM THE WEST	ABOUT 3000 B.C.
CHOW DYNASTY FOUNDED	" 1122 B.C.
PHILOSOPHER LAO-TZE BORN	" 600 B.C.
PHILOSOPHER CONFUCIUS BORN	" 551 B.C.
TSIN DYNASTY FOUNDED	" 255 B.C.
GREAT WALL BUILT	3RD CENTURY
BUDDHISM INTRODUCED FROM INDIA	190 A.D.
TANG DYNASTY FOUNDED	618 A.D.

CHALDEA ··· PERSIA ··· ASSYRIA



DOOR SOCKET OF SARGON I

	MEANING	ARCHAIC CHARACTERS, B.C. 4000	ARCHAIC CURSIVE FORMS, B.C. 3500	ASSYRIAN, B.C. 700	LATE BABYLONIAN, B.C. 600
1.	The sun				
2.	God, heaven				
3.	Mountain				
4.	Man				
5.	Ox				
6.	Fish				

DEVELOPMENT OF CUNEIFORM WRITING (AFTER KING)

-CUNEIFORM WRITING-

THE TOMB OF CYRUS AT PASARGADAG

ASSYRIAN HELMET

AN ARCHER

A PERSIAN FOOT SOLDIER

AN INFANTRY OFFICER

ASSYRIAN WARRIORS

AN ASSYRIAN BED

A CONTRACT TABLET

CHRONOLOGICAL SUMMARY

CHALDEA OR BABYLONIA

	BC.
SARGON, KING OF CHALDEA	3800
BABYLON BECOMES THE POLITICAL CENTER ABOUT	2400
CHALDEA CAPTURED BY ASSYRIANS	2286

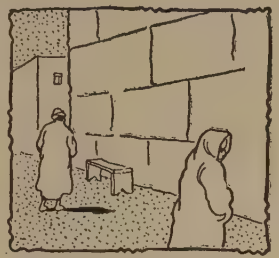
PERSIA

	BC
CYAXARES, KING OF PERSIA	625
NINEVEH CAPTURED BY MEDES	606
NEBUCHADNEZZAR	604
CYRUS CAPTURES BABYLON	538
DARIUS I	522
PERSIANS DEFEATED AT MARATHON	490
BATTLE DE ARBELA	331

-ASSYRIA-

	BC
TIGLATH-PILESER I	1130
ASSUR-NAZIR-PAL	883
TIGLATH-PILESER II	745
TEN TRIBES OF ISRAEL CAPTURED	722
SENNACHERIB	701
ESARHADDON	680
ASSUR-BANI-PAL	668

The Hebrews.



THE WAILING PLACE OF THE JEWS

JEW READING ANCIENT SCROLL

THE TOMB OF RACHEL

CHRONOLOGICAL SUMMARY

	B.C.
ABRAHAM EMIGRATED FROM UR	2000
THE EXODUS	1700
KING SOLOMON	1015
KINGDOM OF ISRAEL	975-722
KINGDOM OF JUDAH	975-586
CONQUEST OF PALESTINE BY ALEXANDER	330
JERUSALEM CAPTURED BY POMPEY	63
JERUSALEM DESTROYED BY TITUS	A.D. 70
MOSQUE OF OMAR BUILT AT JERUSALEM	637

JEWISH CAPTIVES BEFORE SENNACHERIB

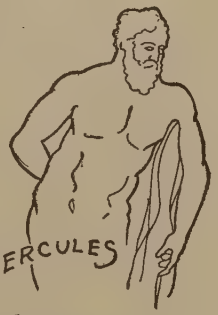
JEWISH PRIEST OFFERING INCENSE

GREECE

HEROIC PERIOD
1400 – 1100 B.C.

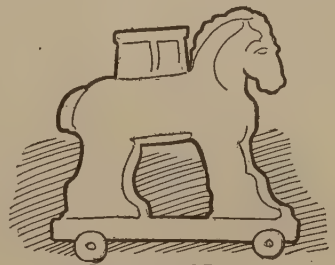
HEROES

HERCULES
THESEUS
PERSEUS
JASON
ULYSSES



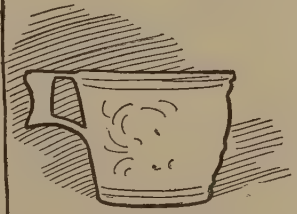
HERCULES

SCYLLA



– THE WOODEN HORSE –
THE RUSE BY WHICH THE GREEKS CAPTURED TROY

FIFTY OARED GREEK BOAT



– ONE OF THE FAMOUS VAPHIO CUPS –

CHRONOLOGICAL SUMMARY

	B.C.
CONQUEST OF THE PELASGIANS IN SOUTHERN GREECE BY THE ARCHAEANS	1320
THE TROJAN WAR	1194–1184
THE DORIAN MIGRATION	1100

MEETING OF ULYSSES AND PENELOPE

EVENTS

THE LABORS OF HERCULES.
THE QUEST OF THE GOLDEN FLEECE.
THE TROJAN WAR.

GREECE

PERIOD OF GLORY
500 – 430 B.C.

FAMOUS MEN

- PERIANDER
- DRACO
- SOLON
- LEONIDAS
- THEMISTOCLES
- ARISTIDES
- CIMON
- EPHIALTES
- PERICLES

PLAN OF THE BATTLE OF MARATHON

PERICLES

TRADITIONAL LIKENESS OF LEONIDAS

HOPLITE OR HEAVY ARMED GREEK WARRIOR

LIGHT ARMED GREEK SOLDIER

CHRONOLOGICAL SUMMARY

	B.C.
THE IONIC REVOLT	500-494
BATTLE OF MARATHON	490
THERMOPYLAE & SALAMIS	480
PLATAEA & MYCALE	479
CONFEDERACY OF DELOS	477
PERICLES	459-429
THE LONG WALLS BUILT AT ATHENS	458
THE THIRTY YEARS TRUCE	445

SOLDIERS PREPARING FOR WAR

IMPORTANT BATTLES

- BURNING OF SARDIS
- MARATHON
- THERMOPYLAE
- SALAMIS
- PLATAEA
- MYCALE

GREECE

PERIOD OF DECLINE
431 - 146 B.C.

PHILIP OF MACEDON

THE MOURNING ATHENA

ALEXANDER THE GREAT

A HERMES PILLAR

FAMOUS MEN

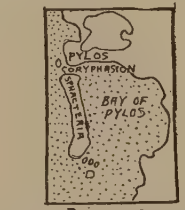
- ARCHIDAMUS
- BRASIDAS
- ALCIBIADES
- LYSANDER
- XENOPHON
- DIONYSIUS
- DEMOSTHENES

IMPORTANT BATTLES

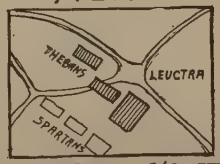
- MANTINEA
- ARGINUSAE
- FALL OF ATHENS
- LEUCTRA
- CHAERONEA
- GRANICUS
- ARBELA

CHRONOLOGICAL SUMMARY

	B.C.
Peloponnesian War	431-404
Supremacy of Sparta	404-371
Battle of Leuctra	371
Alexander's Empire	336-323
Wars of the Succession	323-276
The Gallic Invasion	278
Battle of Cannae	216
Capture of Syracuse	212
Destruction of Corinth	146



-PYLOS-



PLAN OF BATTLE OF LEUCTRA.

GREEK CIVILIZATION

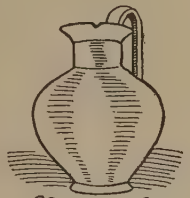
GREEK RUNNERS

STYLES OF HAIR-DRESSING

THE ATHENIAN TYRANNICIDES, HARMODIUS & ARISTOGITON

DOOR KEY

GREEK HARP



GREEK JUG

A METAL WORKER

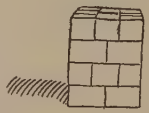
A SQUARE ALTAR

CIRCULAR GARLANDED ALTAR

GREEK COINS

ETRINE

COIN



ANCIENT STONE ALTAR

CIVILIZATION

Religion
Deities
Oracles

Education

Art
Architecture
Sculpture
Painting
Music

Literature
Philosophy
Oratory
Poetry
Drama

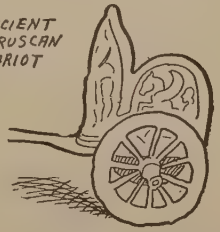
Institutions
Social Customs
Festivals
Slavery

ROME · LEGENDARY PERIOD ·

753 – 509 B.C.

ITALY
BEFORE THE GROWTH OF THE ROMAN EMPIRE

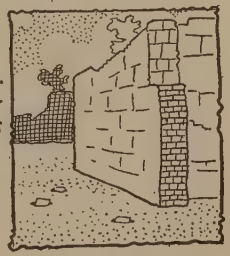
AN ETRUSCAN MUSICIAN



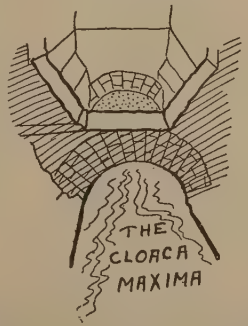
ANCIENT ETRUSCAN CHARIOT

CHRONOLOGICAL SUMMARY

	B.C.
FOUNDING OF ROME	753
NUMA POMPILIUS	716
TULLUS HOSTILIUS	672
ANCUS MARTIUS	640
LUCIUS TARQUINIUS	616
SERVIUS TULLIUS	578
TARQUINIUS SUPERBUS	534
EXPULSION OF THE KINGS	509



ORIGINAL WALL BUILT BY ROMULUS



THE CLOACA MAXIMA

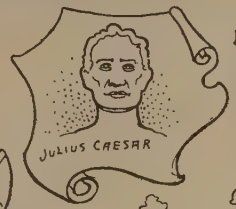
THE BRONZE WOLF OF THE CAPITOL

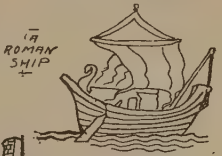
A ROMAN SOLDIER

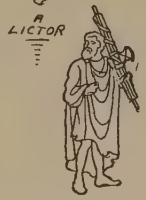
ROME

THE REPUBLIC

509 – 31 B.C.







CHRONOLOGICAL SUMMARY

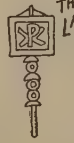
	B.C.
REPUBLIC ESTABLISHED	509
SACK OF ROME BY THE GAULS	390
THE SAMNITE WARS	343-290
THE PUNIC WARS	264-146
THE MACEDONIAN WARS	215-168
THE MITHRIDATIC WARS	88-63
JULIUS CAESAR	59-44
BATTLE OF PHILIPPI	42
BATTLE OF ACTIUM	31

AUGER'S BIRDS

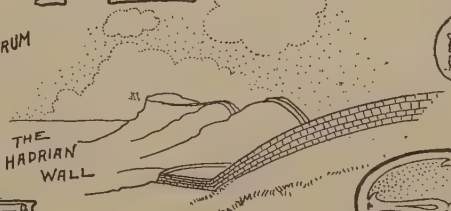
ROME · THE EMPIRE ·

31 B.C – 476 A.D.

-MÆCENAS-



THE LABARUM



THE HADRIAN WALL

CHRIST AS THE GOOD SHEPHERD (FROM THE CATACOMBS)

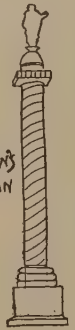
-CARACALLA-

SHIELD - TIME OF -TRAJAN-

-DIOCLETIAN-

THE ARCH OF CONSTANTINE

-HADRIAN-



TRAJAN'S COLUMN

-NERO-

A GOTHIC GEM

-VESPASIAN-

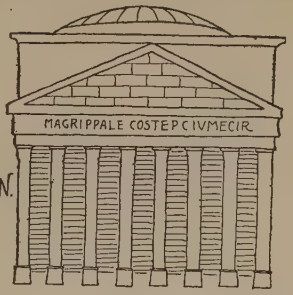
-CHRONOLOGICAL SUMMARY-

	A.D.
BURNING OF ROME	64
JERUSALEM DESTROYED BY TITUS	70
DESTRUCTION OF HERCULANEUM & POMPEII	79
CONQUEST OF BRITAIN	85
DISPERSION OF THE JEWISH RACE	132-135
CHRISTIANITY BECOMES THE STATE RELIGION	313
FINAL DIVISION OF THE EMPIRE	395
SACK OF ROME BY ALARIC	410
ROME PILLAGED BY VANDALS	455

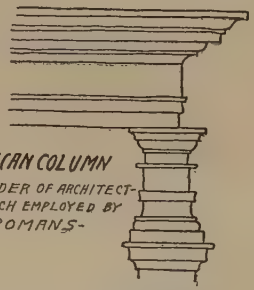
THE -JUDÆA CAPTA- COIN OF VESPASIAN

ROMAN CIVILIZATION

AN ETRUSCAN ALTAR



THE PANTHEON.



TUSCAN COLUMN

AN ORDER OF ARCHITECTURE MUCH EMPLOYED BY THE ROMANS.

MARS
- RESTING -

- A STATUE IN THE VILLA LUDOVISI, ROME -

ROMAN TRIPOD

CICERO
ONE OF THE GREATEST ROMAN ORATORS

Roman Civilization

CHARACTER.
RELIGION.
Gods.
Laws.
Penalties.
EDUCATION.
Schools.
GOVERNMENT.
Republican.
Imperial.

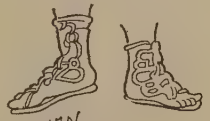
ART.
Architecture.
Sculpture.
Painting.
LITERATURE.
Origin.
Republican Period.
Augustan Epoch.
Decline.

CAMEO RING
DATING FROM TIME OF AUGUSTINE

ROMAN BOXING GLOVES
MADE OF LEATHER AND LOADED WITH LEAD

SOCIAL CUSTOMS OF THE ROMANS

A ROMAN ORATOR WEARING THE —TOGA—



ROMAN SANDALS

HELMET

ROMAN PLOW

GLADIATOR (FROM OLD MOSAIC)

RING

DATING FROM THE PERIOD OF THE EMPIRE

SOCIAL CUSTOMS

HOMES.
Architecture.
Family Life.
Commercial Life.
Social Life.
Festivals.
Games.

DRESS.
Distinctions.
The Toga.
The Tunic.

MARRIAGE.
Preparation.
Ceremony.

DEATH.
Funerals.
Ceremonies.

SLAVERY.
Origin.
Influence.
Number of Slaves.
How Employed.

ETRUSCAN BURIAL URN

SEMICIRCULAR DINING COUCH (FROM A WALL PAINTING)

ROMAN HORN

ROMA—PATRON GODDESS OF THE CITY—

"THE NIOBE OF NATIONS." "QUEEN OF CITIES." "IMPERIAL CITY." "SEVEN HILLED CITY." "VALENTIA."

THE ROMAN EAGLE

The ETERNAL CITY.

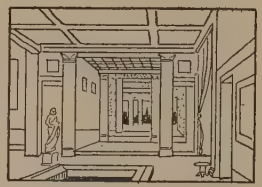
"NAMELESS CITY"

"CITY OF THE CAESARS"

THE SEVEN HILLS OF ·ROME·

THE ROMAN FORUM RESTORED

1-TEMPLE OF JUPITER
2- " " VESTA
3-BASILICA JULIA
4-REGIA
5-TEMPLE OF CASTOR & POLLUX
6-TABULARIUM
7-TEMPLE OF SATURN
8- " " VESPASIAN
9-TEMPLE OF CONCORD
10-COLUMN OF PHOCAS
11-STATUE OF DOMITIAN
12-ARCH OF S. SEVERUS
13-BASILICÆ
14-TEMPLE OF ANTONINUS FAUSTINA
15-ROSTRUM

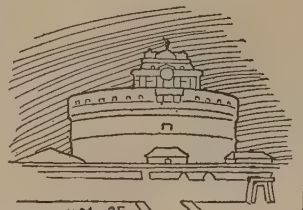


INTERIOR OF A ROMAN HOUSE

—THE— FLAVIAN AMPHITHEATER —OR— —COLOSSEUM—

"Mistress of the World"

B.C.		A.D.	
753.	Rome Founded.	64.	Rome Burned.
	THE SEVEN KINGS.	80–312.	Triumphal Arches.
753-716.	Romulus.	190.	Memorial Arches.
716-672.	Numa Pompilius.	80.	Colosseum Built.
672-640.	Tulius Hostilius.	455.	Plundered by Vandals.
640-614.	Ancus Martius.	1309.	Papal Chair Removed.
616-578.	Lucius Tarquinius.	1527.	Sacked by Bourbons.
578-534.	Servius Tullius.	1798.	Occupied by French.
534-509.	Tarquinius Superbus.	1848.	Pius IX. Driven out.
509.	Expulsion of Kings.	1849.	Pope Returns.
615.	Capitol Begun.	1871.	Capital of United Italy.
530.	Capitol Completed.	1901.	Population 512,000.
390.	Besieged by Gauls.		



—MAUSOLEUM OF HADRIAN BUILT BY HIMSELF AT ROME—

"THE LONE MOTHER OF DEAD EMPIRES"

MYTHOLOGY

CERES ROMAN GODDESS OF HARVESTS

MYTHOLOGY

Egyptian Gods.
Isis. Set.
Osiris. Ra.
Horus. Ptah.

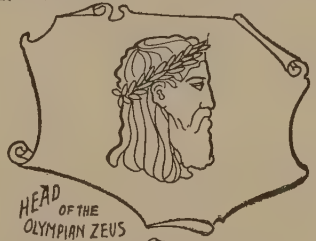
Their Teaching and Beliefs on
Morality
Future Life
Judgment of the Dead.
Animal Worship

Roman and Grecian Gods.
Jupiter, Argus, Apollo, Eolus, Eros, Neptune, Pluto, Hymen

Hindoo Gods.
Marut, Surya, Agni. Savan, Poleas.

ASSUR CHIEF ASSYRIAN DEITY

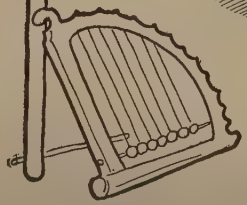
HORUS AN EGYPTIAN GOD

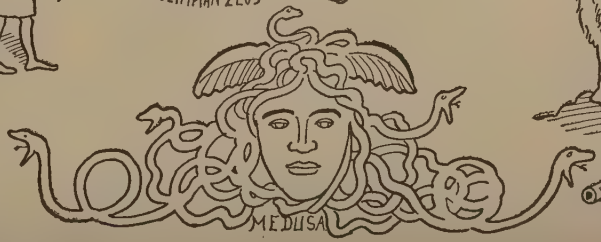


HEAD OF THE OLYMPIAN ZEUS

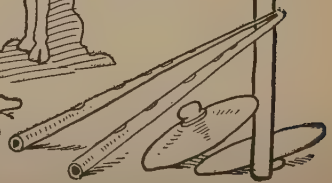
PAN

THE GREEK GOD OF THE WOODS & FIELDS.

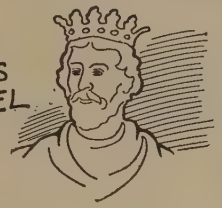




MEDUSA



MOHAMMEDANISM



CHARLES MARTEL

MOHAMMED

THE MUEZZIN

AN ARAB CHIEFTAIN

CHRONOLOGICAL SUMMARY

	A.D.
BIRTH OF MOHAMMED	570
THE HEGIRA	622
THE RETURN TO MECCA	630
DEATH OF MOHAMMED	632
OMAR CAPTURES JERUSALEM	637
SARACENS CONQUER AFRICA & ENTER SPAIN	711
SARACENS REPULSED AT CONSTANTINOPLE	717
SARACENS REPULSED AT TOURS	732
END OF MOHAMMEDAN EXPANSION	750
HAROUN-AL-RASCHID, CALIPH	786

A SARACEN KNIGHT

MOHAMMED'S SIGNATURE

Medieval and Modern History

There is nothing more interesting than the study of history, and after supplying you with our series of pen sketches on ancient history we feel quite sure that you would not feel satisfied without a general survey of the history of the world, as shown by a few of the more prominent nations of the world.

We realize our inability to depict in fulness the number of minor events connected with this history, but we have endeavored to show, in a general way, the characteristic events and periods.

A familiarity with these charts and the outlines on them will not only give one a general knowledge of history, but will create an interest in the study and will enable one to associate other events with them as such study may be developed. Our pen sketch reviews of the Middle Ages, Feudalism and Chivalry, the Crusades and the Renaissance, acquaint one in a general way with subjects of prime importance in this study. A review of the history of France, in connection with these charts, and followed with special graphic pages, showing the French Revolution and France from the Consulate to the Present Time, gives one a bird's eye view of the subject and opens up so many avenues of research that one enters into such study with pleasure and develops it with profit.

In beginning the special study of England, we show a chart depicting the happenings prior to the Norman Conquest and follow with pen sketches showing the events in the Middle Ages, England Under the Stuarts and English History Since the Accession of Queen Victoria. This but shows our treatment of one of the great powers and so illustrates epochs and events that they become fixed mental pictures. Germany, Russia and Italy have special graphic treatment in this review.

Our modern history is supplemented with a review of the Norsemen and Columbus and their connection with the discovery of the New World, and this series of charts on medieval and modern history is followed by a pictorial review of the history of our own country and the very complete series of charts illustrating same.

France During the Middle Ages.
England Before the Norman Conquest.
Holy Roman Empire of the German Nation.
Feudalism and Chivalry.
The Crusades.
England During the Middle Ages.
The Renaissance.
England Under the Stuarts.
Russia.
French Revolution.
France From Consulate to Present Time.
England Since the Accession of Victoria.
Germany After 1814.
Unification of Italy.
The Norsemen in America.
Columbus.

FRANCE DURING THE MIDDLE AGES

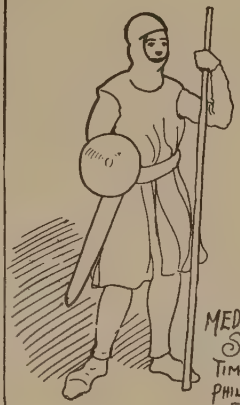
CHRONOLOGICAL SUMMARY

EVENT	DATE
CHARLEMAGNE EMPEROR	800
LOUIS THE PIOUS	814
VIKINGS IN SAXONY	851
PARIS BURNED BY VIKINGS	857
CHARLES THE BALD	875
CHARLES THE FAT	882
HUGH CAPET	987
FIRST CRUSADE	1096
SECOND CRUSADE	1147
PHILIP THE FAIR	1285
HUNDRED YEARS WAR	1338
POITIERS	1356
PEACE OF BRETIGNY	1360
MURDER OF DUKE OF ORLEANS	1407
AGINCOURT	1415
CASTILLON	1453

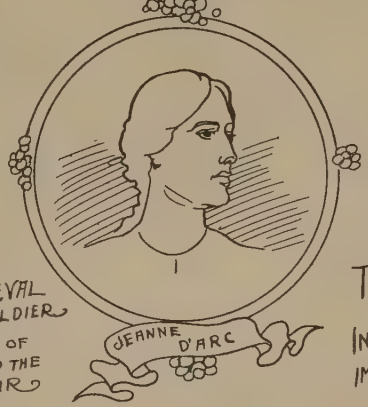
CHARLES THE SIMPLE

CHARLEMAGNE

CATHEDRAL OF AIX-LA-CHAPELLE
BURIAL PLACE OF CHARLEMAGNE

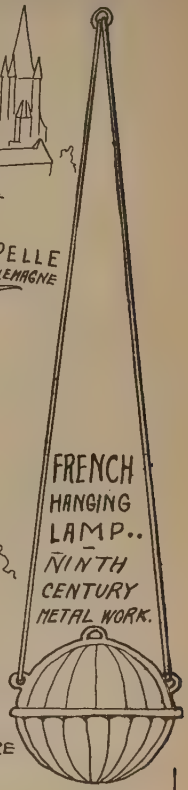


MEDIEVAL SOLDIER
TIME OF PHILIP THE FAIR



JEANNE D'ARC

TOWER OF JEANNE D'ARC
IN WHICH SHE WAS IMPRISONED AND TRIED AT ROUEN-FRANCE

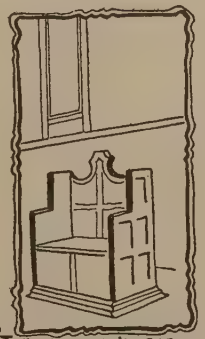


FRENCH HANGING LAMP.. NINTH CENTURY METAL WORK.

ENGLAND BEFORE THE NORMAN CONQUEST

GREAT MEN

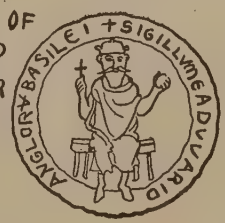
ALFRED THE GREAT
ST. AUGUSTINE
ST. DUNSTAN
EGBERT
CANUTE
EDWARD
HAROLD
THE VENERABLE BEDE--
CAEDMON



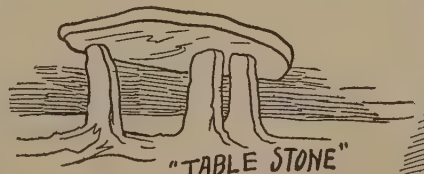
ST. AUGUSTINE'S CHAIR
RELIC OF THE FIRST ARCHBISHOP OF CANTERBURY

A DRUID PRIEST

ANGLO-SAXON BUCKLE



SEAL OF EDWARD THE CONFESSOR



"TABLE STONE"

SAINT MARTIN'S CROSS

CELTIC BROOCH— THE INFANT CHRIST BORNE BY SAINT CHRISTOPHER

CHRONOLOGICAL SUMMARY

FIRST VISIT OF JULIUS CAESAR TO BRITAIN—B.C. 55

ROMAN TROOPS WITHDRAW—A.D. 407

LANDING OF HENGIST & HORSA—449

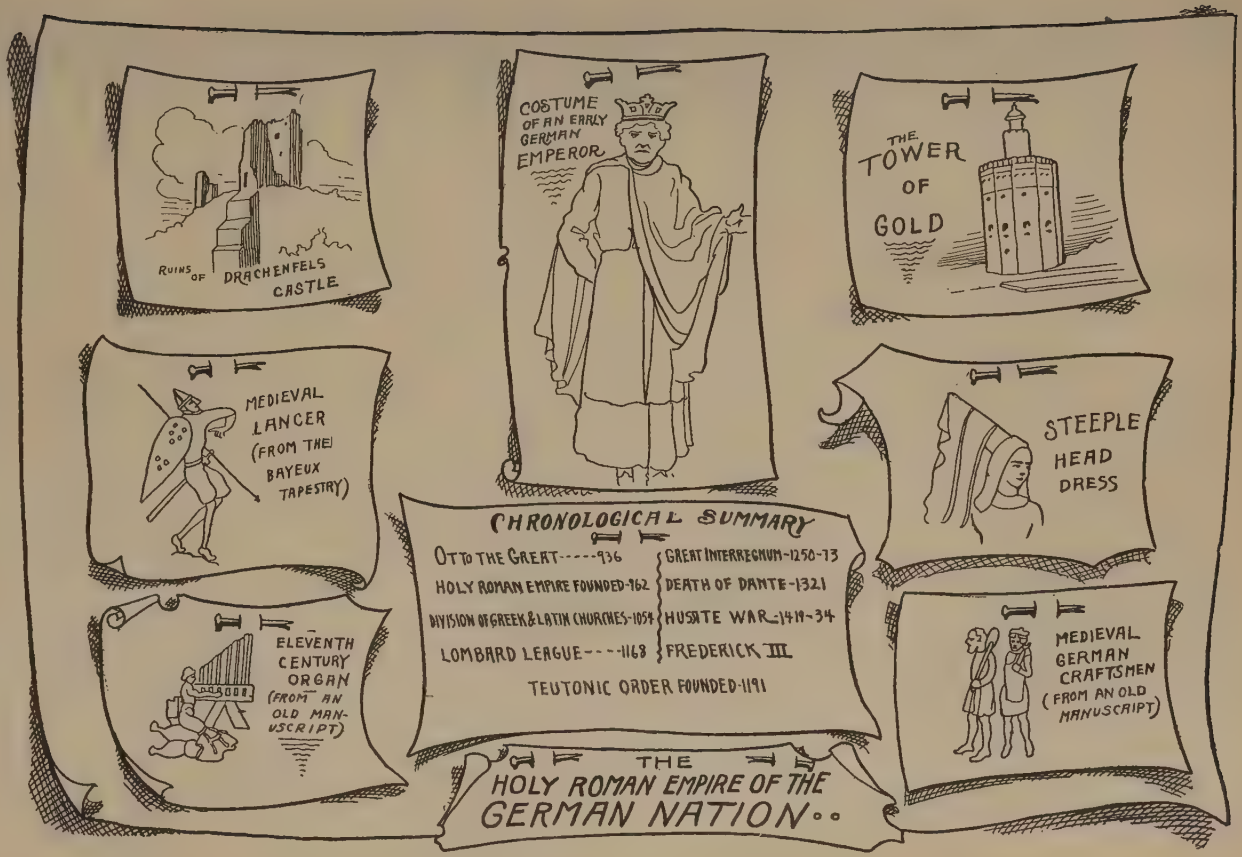
EGBERT KING OF ENGLAND—829

ALFRED THE GREAT—871

CANUTE—1016

EDWARD THE CONFESSOR 1042

HAROLD ELECTED KING --- 1066


RUINS OF DRACHENFELS CASTLE
COSTUME OF AN EARLY GERMAN EMPEROR
THE TOWER OF GOLD
MEDIEVAL LANCER (FROM THE BAYEUX TAPESTRY)
STEEPLE HEAD DRESS
ELEVENTH CENTURY ORGAN (FROM AN OLD MANUSCRIPT)
MEDIEVAL GERMAN CRAFTSMEN (FROM AN OLD MANUSCRIPT)
CHRONOLOGICAL SUMMARY
OTTO THE GREAT ----- 936
HOLY ROMAN EMPIRE FOUNDED-962
DIVISION OF GREEK & LATIN CHURCHES-1054
LOMBARD LEAGUE ---- 1168
TEUTONIC ORDER FOUNDED-1191
GREAT INTERREGNUM-1250-73
DEATH OF DANTE-1321
HUSSITE WAR-1419-34
FREDERICK III
THE HOLY ROMAN EMPIRE OF THE GERMAN NATION..

FEUDALISM AND CHIVALRY

Feudalism

Origin - Latter part of 5th Cent.
Social Organizations
Act of Homage - Ceremony of Investiture
Feudal Obligations
Hereditary Rights
Feudal Homes and Families
Place of Church in Society
Military System
Decline in 14th Cent.
Defects and Merits

Chivalry

Knighthood
Knightly Virtues - Membership
Education - Ceremonies
Tournaments
Jousting - Awards
Decline - 14th Cent.
Influences

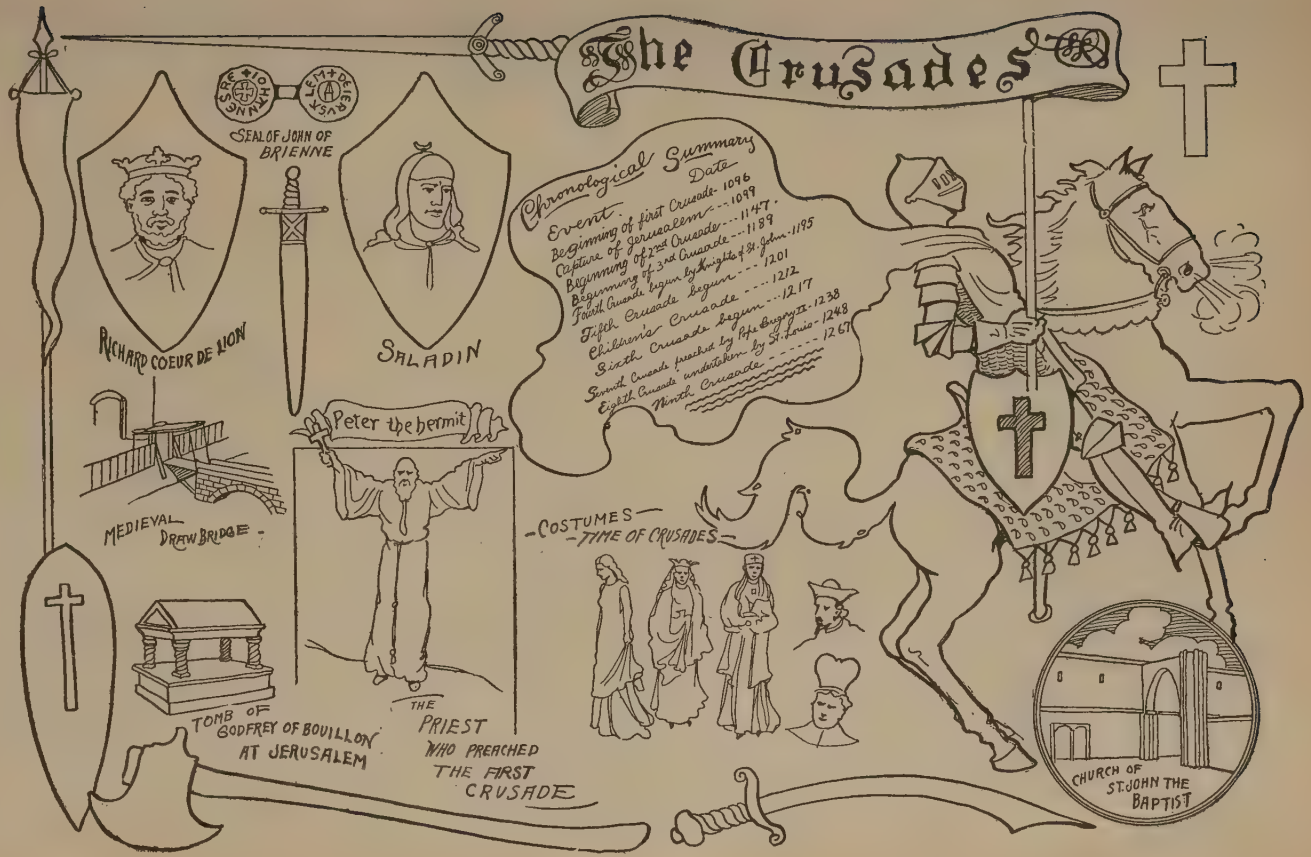
MEDIEVAL TOURNAMENT.

HAWKING— ONE OF THE PRINCIPAL SPORTS OF THE FEUDAL AGE

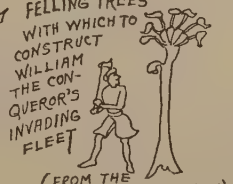
SERF AT WORK (FROM A TWELFTH CENTURY MANUSCRIPT)

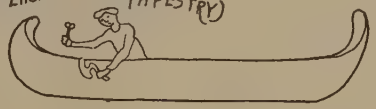
DEVELOPMENT OF A KNIGHT

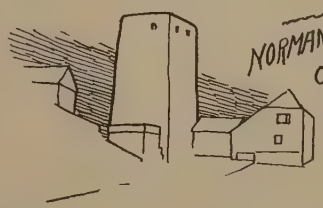
PAGE
BETWEEN THE AGES OF SEVEN & FOURTEEN, HE IS INSTRUCTED IN THE ART OF WAR-----
SQUIRE
AS A SQUIRE HE ATTENDS THE KNIGHT TO WHOM HE IS ATTACHED-----
KNIGHTED
AT THE AGE OF TWENTY-ONE HE IS KNIGHTED
A FULL FLEDGED KNIGHT


The Crusades
Chronological Summary
Event — Date
Beginning of first Crusade — 1096
Capture of Jerusalem — 1099
Beginning of 2nd Crusade — 1147
Beginning of 3rd Crusade — 1189
Beginning of Knights of St. John — 1195
Fourth Crusade begun by Knights — 1201
Fifth Crusade begun — 1212
Children's Crusade begun — 1217
Sixth Crusade preached by Pope Gregory IX — 1238
Seventh Crusade undertaken by St. Louis — 1248
Eighth Crusade — 1267
Ninth Crusade
SEAL OF JOHN OF BRIENNE
RICHARD COEUR DE LION
SALADIN
Peter the hermit
MEDIEVAL DRAW BRIDGE
COSTUMES — TIME OF CRUSADES
TOMB OF GODFREY OF BOUILLON AT JERUSALEM
THE PRIEST WHO PREACHED THE FIRST CRUSADE
CHURCH OF ST. JOHN THE BAPTIST

ENGLAND DURING THE MIDDLE AGES





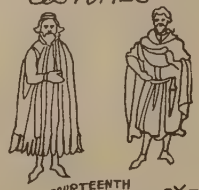


CHRONOLOGICAL SUMMARY

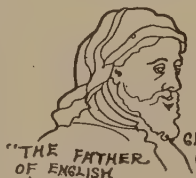
EVENT	DATE
WILLIAM I	1066
DOMESDAY BOOK	1086
WILLIAM RUFUS	1087
HENRY I	1100
STEPHEN	1135
HENRY II	1154
THOMAS A'BECKET	1170
RICHARD I	1189
KING JOHN	1199
THE MAGNA CHARTA	1215
HENRY III	1216
EDWARD I	1272
EDWARD II	1307
EDWARD III	1327
BATTLE OF CRE'CY	1346
THE PLAGUE	1349
BATTLE OF POITIERS	1356
RICHARD II	1377
HENRY IV	1399
HENRY V	1413
BATTLE OF AGINCOURT	1415
HENRY VI	1422
JEANNE D'ARC BURNED	1431

HENRY VIII

COSTUMES



— FOURTEENTH CENTURY —

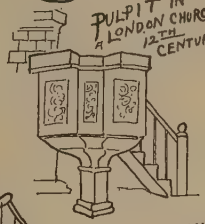


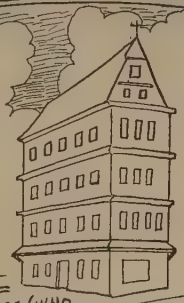
GEOFFREY CHAUCER

EFFIGY OF QUEEN ELEANOR

—KING JOHN—

THE RENAISSANCE





HOUSE OF GUTENBERG (WHO INVENTED PRINTING) IN STRASBURG, GERMANY

SIXTEENTH CENTURY WOOD CARVING

OUTLINE

THE LEARNING OF THE EARLY MIDDLE AGES -
- SCHOLASTICISM
- THE LATER SCHOOLMEN
- THE UNIVERSITIES

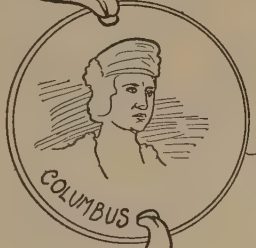
THE NEW LEARNING

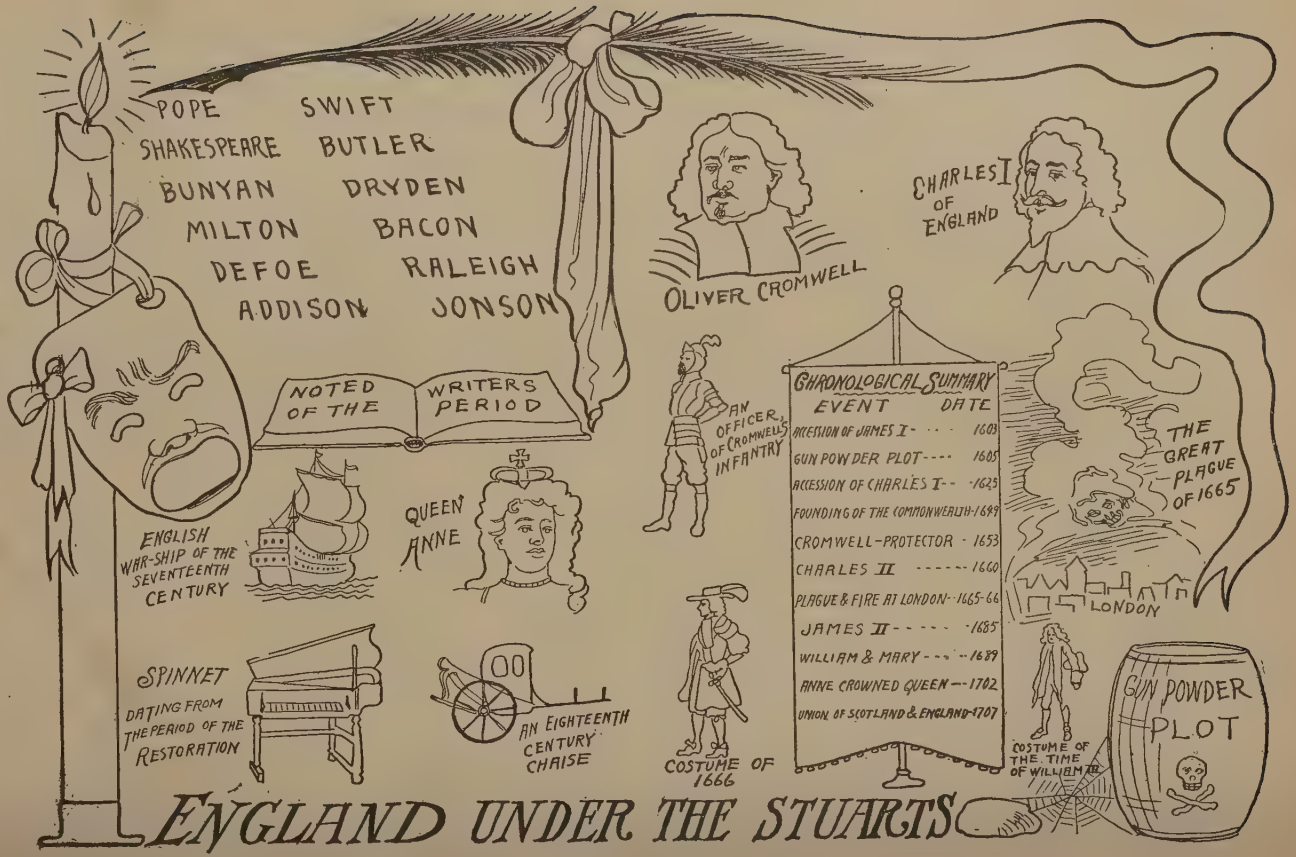
THE REVIVAL IN LITERATURE
- IN ITALY
- IN FRANCE
- IN SPAIN

THE COMMERCIAL REVIVAL

HOUSE OF MICHELANGELO

PRINTERS MARK USED BY LEEU - 1482




POPE
SWIFT
SHAKESPEARE
BUTLER
BUNYAN
DRYDEN
MILTON
BACON
DEFOE
RALEIGH
ADDISON
JONSON
NOTED WRITERS OF THE PERIOD
OLIVER CROMWELL
CHARLES I OF ENGLAND
AN OFFICER OF CROMWELL'S INFANTRY
CHRONOLOGICAL SUMMARY
EVENT DATE
ACCESSION OF JAMES I ... 1603
GUN POWDER PLOT ... 1605
ACCESSION OF CHARLES I ... 1625
FOUNDING OF THE COMMONWEALTH 1649
CROMWELL-PROTECTOR ... 1653
CHARLES II ... 1660
PLAGUE & FIRE AT LONDON ... 1665-66
JAMES II ... 1685
WILLIAM & MARY ... 1689
ANNE CROWNED QUEEN ... 1702
UNION OF SCOTLAND & ENGLAND 1707
THE GREAT PLAGUE OF 1665
LONDON
ENGLISH WAR-SHIP OF THE SEVENTEENTH CENTURY
QUEEN ANNE
SPINNET
DATING FROM THE PERIOD OF THE RESTORATION
AN EIGHTEENTH CENTURY CHAISE
COSTUME OF 1666
COSTUME OF THE TIME OF WILLIAM III
GUN POWDER PLOT
ENGLAND UNDER THE STUARTS

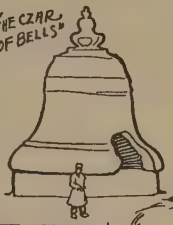
RUSSIA

GENERAL KUROPATKIN

PETER THE GREAT

CZAR NICHOLAS II

-THE RUSSIAN BATTLE SHIP "RETVIZAN TORPEDOED AT PORT ARTHUR, REPAIRED, AND AFTERWARD SUNK BY JAPANESE LAND BATTERIES----------



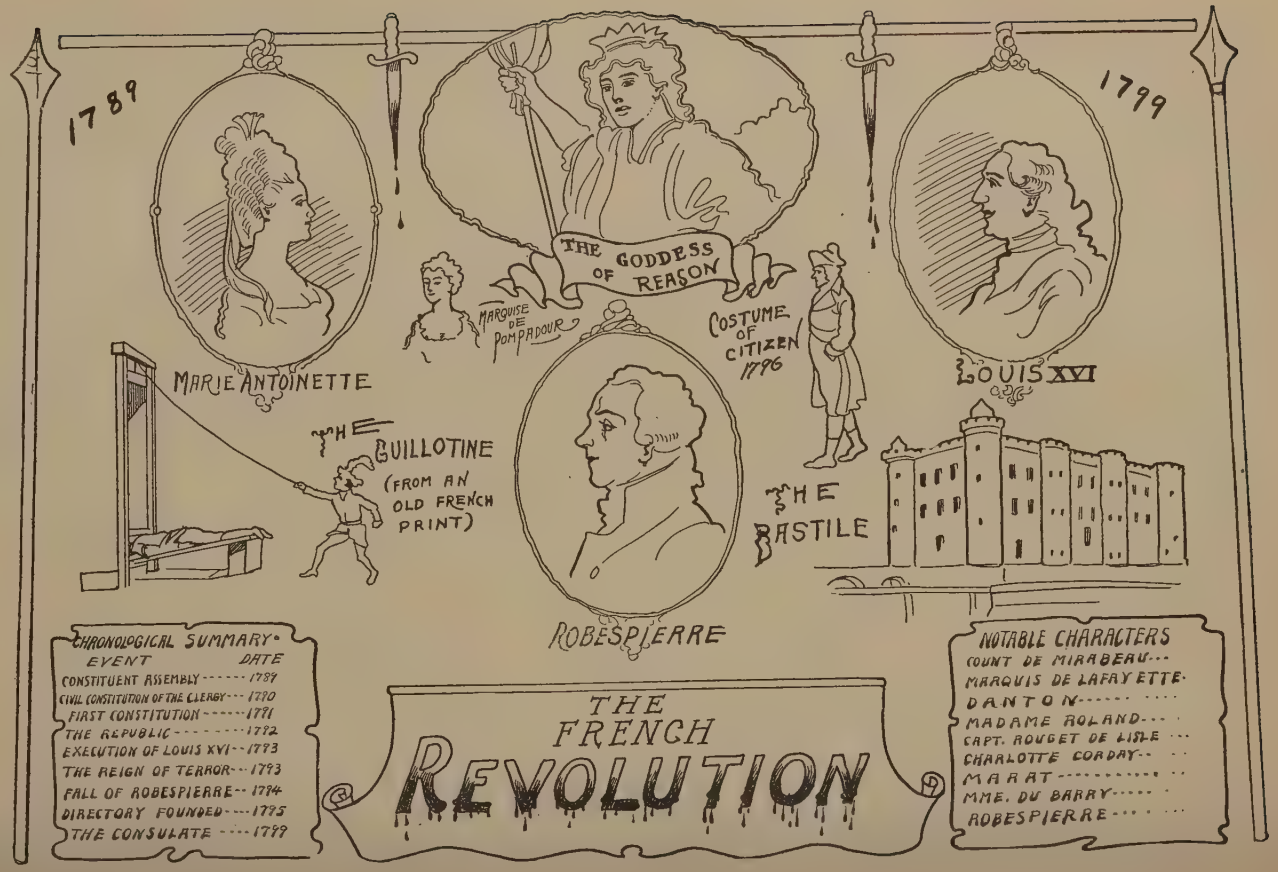
"THE CZAR OF BELLS"

REVOLUTION

AFTER THE JAPANESE WAR

CHRONOLOGICAL SUMMARY

ROMANOFF DYNASTY	1612
SOPHIA	1681
PETER THE GREAT	1689
CAPTURE OF AZOV	1696
ST. PETERSBURG FOUNDED	1703
CATHERINE	1762
THE CRIMEA ANNEXED	1783
NICHOLAS I	1825
ALEXANDER II	1855
OCCUPATION OF MANCHURIA	1860
SALE OF ALASKA	1867
ALEXANDER III	1881
NICHOLAS II	1894
RUSSO-JAPANESE WAR	1904-05



CHRONOLOGICAL SUMMARY	
EVENT	DATE
CONSTITUENT ASSEMBLY	1789
CIVIL CONSTITUTION OF THE CLERGY	1790
FIRST CONSTITUTION	1791
THE REPUBLIC	1792
EXECUTION OF LOUIS XVI	1793
THE REIGN OF TERROR	1793
FALL OF ROBESPIERRE	1794
DIRECTORY FOUNDED	1795
THE CONSULATE	1799

THE FRENCH REVOLUTION

NOTABLE CHARACTERS

COUNT DE MIRABEAU
MARQUIS DE LAFAYETTE
DANTON
MADAME ROLAND
CAPT. ROUGET DE LISLE
CHARLOTTE CORDAY
MARAT
MME. DU BARRY
ROBESPIERRE

—NAPOLEON'S RUSSIAN BEAR HUNT WAS NOT AS SUCCESSFUL AS HE THOUGHT IT WOULD BE—

NAPOLEON BONAPARTE

FRENCH GENERAL

WELLINGTON

—THIERS—
FIRST PRES. OF THE THIRD REPUBLIC

EIFFEL TOWER PARIS 984 FEET HIGH

DUMAS

·CHRONOLOGICAL SUMMARY·

EVENT	DATE
CONSULATE	1799
WATERLOO	1815
RESTORATION OF LOUIS XVIII	1815
DEATH OF NAPOLEON I	1821
THE SECOND REPUBLIC	1848
CRIMEAN WAR	1854
FRANCO-GERMAN WAR	1870
THIRD REPUBLIC	1870
COLONIZATION OF WEST AFRICA	1881
FASHODA AFFAIR	1898
SEPARATION OF CHURCH & STATE	1905

—ÉMILE LOUBET—
SEVENTH PRESIDENT OF THE THIRD REPUBLIC

JEAN BAPTISTE COROT—A CELEBRATED FRENCH LANDSCAPE PAINTER

FRANCE.

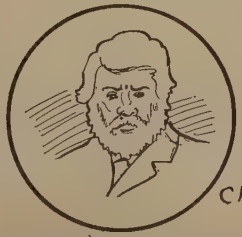
FROM THE CONSULATE TO THE PRESENT TIME.

ENGLAND SINCE THE ACCESSION OF VICTORIA

WILLIAM EWART GLADSTONE

EDWARD VII OF ENGLAND

PENNY POSTAGE ESTABLISHED IN 1841



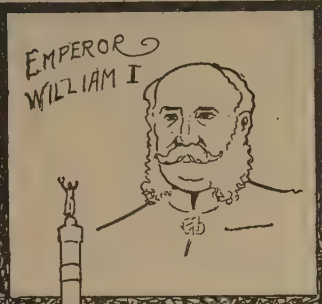
CARLYLE

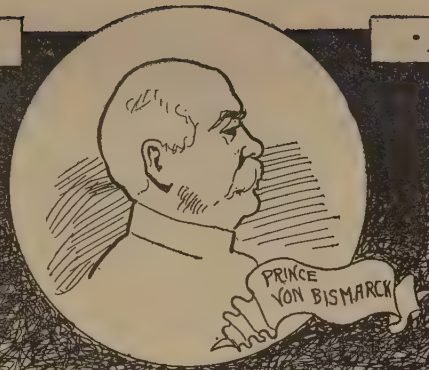
CHRONOLOGICAL SUMMARY

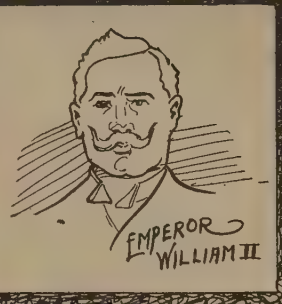
Accession of Queen Victoria	1837
Crimean War	1854
India Transferred to Crown	1858
Canadian Federation	1867
Gladstone's First Ministry	1868
Queen's Jubilee	1897
Boer War	1899
Death of Queen Victoria	1901
Edward VII King of England	1901

WILLIAM MAKEPEACE THACKERAY

GERMANY · AFTER 1814 ·







THE COLUMN OF VICTORY, —BERLIN—
COMMEMORATING THE SUCCESS OF THE GERMAN ARMS —1866-1870

CHRONOLOGICAL SUMMARY

Germanic Confederation	1815
Carlsbad Decrees	1819
First German Parliament	1848
Socialism Founded	1860
Franco-German War	1870
German Empire	1870
Bismarck, Chancellor	1871
German Colonization	1884
Accession of William II	1888
Trouble in Venezuela	1903
Triumph of Socialists	1903
Revolt in S. African Colonies	1904

THE CALL TO ARMS
DETAIL FROM A PEDESTAL PIECE OF THE GERMAN NATIONAL MONUMENT

GREAT GERMAN MUSICIANS

HAYDN	SCHUMAN
MOZART	JOHN STRAUS
BEETHOVEN	R. STRUS
SCHUBERT	WAGNER

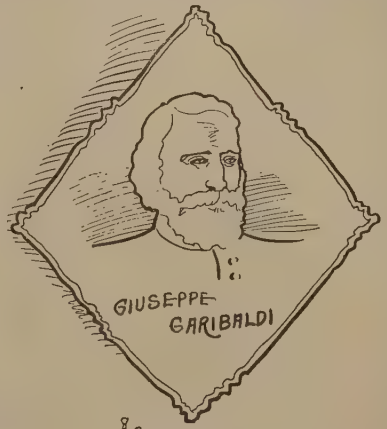
FAMOUS GERMAN WRITERS

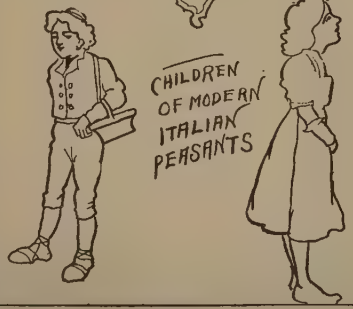
LESSING
GOETHE
SCHILLER
KÖRNER
UHLAND
GRIMM
KANT
HUMBOLDT
HEINE
FREYTAG
SCHEFFEL
VON RANKE
MOMMSEN
SUDERMAN
HAUPTMANN
RICHTER

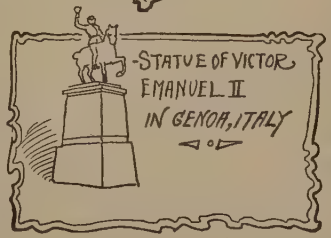
UNIFICATION OF ITALY

Outline

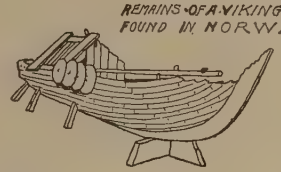
Italy under foreign rule
Growth of National Consciousness
Influence of July Revolution in France
Young Italy
The Revolution of 1848
The Leadership of Cavour
The War of Liberation
The Kingdom of Italy
Recent History







THE NORSEMEN IN AMERICA



REMAINS OF A VIKING SHIP FOUND IN NORWAY.

A NORTH MAN.

VINLAND

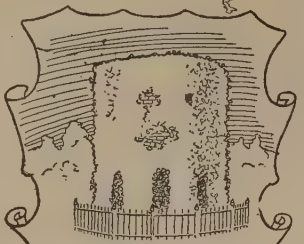
492 YEARS BEFORE COLUMBUS

ROCK TRACING

OUTLINE

TIME } BJORN HERJULFSON – 986
PERSON } LEIF ERICSON – 1001

CAUSES – CLIMATE & PRODUCTIONS INVITING
PLACES – LABRADOR & COAST OF U. S.
EVIDENCES – ANNALS OF ICELAND & TRADITION
RESULTS – NAMED VINLAND – NOTHING PERMANENT



THE "OLD STONE MILL"

COLUMBUS.

·BIOGRAPHY·

BIRTH- HE WAS BORN IN GENOA ITALY-1435

PARENTAGE- HIS PARENTS WERE POOR, YET HONEST AND INDUSTRIOUS-

EDUCATION- FOR A SHORT TIME HE ATTENDED THE UNIVERSITY AT LAVIA, PAYING ESPECIAL ATTENTION TO STUDIES RELATED TO THE SEA.

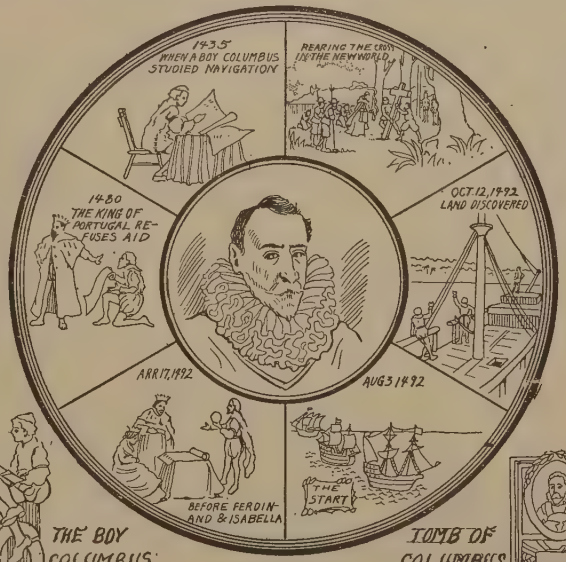
MARRIAGE- HE MARRIED A DAUGHTER OF A RENOWNED NAVIGATOR- GOV OF ONE OF THE MADEIRA ISLANDS.

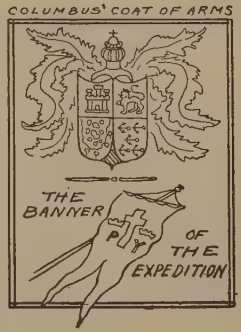
VOYAGES- GOING TO SEA AT THE AGE OF FOURTEEN, HE SAILED MUCH ON THE MED. SEA. THERE IS A CLAIM THAT HE VISITED ICELAND. HE MADE FOUR VOYAGES TO AMERICA.

CHARACTER- RESOLUTE, ENERGETIC, PERSEVERING, YET SENSITIVE. HE WAS DEVOUTLY PIOUS

DEATH- HE DIED IN 1506 IN SPAIN

BURIAL- HE WAS FIRST BURIED AT VALLADOLID, SPAIN, THEN HIS REMAINS WERE REMOVED TO SEVILLE, THEN TO HAYTI & NEXT TO HAVANA, CUBA. FROM THERE THEY WERE TAKEN BACK TO SPAIN-


1435 WHEN A BOY COLUMBUS STUDIED NAVIGATION
BEARING THE CROSS TO THE NEW WORLD
OCT. 12, 1492 LAND DISCOVERED
AUG 3 1492
THE START
ARR 17, 1492
BEFORE FERDINAND & ISABELLA
1480 THE KING OF PORTUGAL REFUSES AID



THE BOY COLUMBUS

TOMB OF COLUMBUS

Methods of Teaching History

I. Purposes.
   1. To present facts in such a manner that the principles of growth and government of nations will be established.
   2. To stimulate patriotism and all its attendant virtues.
   3. To develop the minds of pupils to imagine and grasp a situation.
   4. To train the judgment and reasoning powers.
   5. To direct the reading of pupils along supplementary lines and create a permanent choice for historical reading.
   6. To strengthen and develop character.

II. Preparation of the Teacher.
   1. A thorough knowledge of subject.
   2. A knowledge of methods of teaching.
   3. Ability to direct pupils in study.
   4. Ability to present subjects in an interesting manner.

III. Primary Grades—First, Second and Third.
   1. History stories.
   2. Biographies of great men.
   3. Stories of exploration.
   4. Patriotic songs and gems of literature.

IV. Intermediate Grades—Fourth, Fifth and Sixth.
   1. History stories.
   2. Biographies.
   3. Stories of travel.
   4. Memorizing patriotic songs and gems.

V. Grammar Grades—Seventh and Eighth.
   1. Text-books.
   2. Cause and effects.
   3. Maps.
   4. Outlines.
   5. Dates.
   6. Government.
   7. Wars.
   8. Supplementary work.

Flags

I. General Meaning of Term.

II. Uses.
   1. Primary.
      a. An emblem representing principles of government on all public occasions.
      b. To distinguish nations on land or sea.
   2. Secondary.
      a. To distinguish divisions of army in war.
      b. To denote rank of officers in army and navy.
   3. Signs or signals.
      a. Yellow flag—Quarantine.
      b. White flag—Flag of truce.
      c. Flag reversed—Sign of distress.
      d. Lower flag—Act of respect to superior officers.
      e. Half mast—mourning.

f. Signaling at sea—Code for each nation.
g. Dipping flag—Salute.
h. Powder on board—Red.

III. Flags of Nations.
1. United States.
a. Origin.
b. History of.
c. Birthday of Stars and Stripes.
Meaning of.
Stars—how and where placed?
Stripes—why alternate red and white?
Construction of.
Additional stars when?
Permanent arrangement of stars and stripes.
d. Kinds.
President's.
Admiral's.
Vice admiral's.
Rear admiral's.
Commodore's.
Revenue.
2. Foreign countries.
a. England.
b. Spain—red and yellow.
c. Germany, etc.

IV. Influences.
1. Flag Day.
2. Flag on all school houses.
3. Patriotism, etc.

QUESTIONS—FLAGS.

Were you to see a United States warship, how could you determine the rank of the officer in charge?

What flag was hoisted on Dewey's flagship in the battle of Manila Bay? Were he to command another vessel or fleet today, would the same kind of flag be hoisted?

Describe the flag displayed by Paul Jones in 1779.

Oklahoma has recently been added to the sisterhood of states; from what day after her admission was a new star added to the flag?

Who made the first American flag? Which navy first saluted the American flag?

What was the first recorded naval engagement under the flag? When were the colors first unfurled over a foreign country?

When was the flag first seen at a British port? What was the national emblem during the War of 1812?

Who wrote "The Star-Spangled Banner?" Who has the flag that inspired that song?

When did the flag have sixteen stars and fifteen stripes?

Why has our flag thirteen stripes? Who suggested the number of stripes?

When was the revenue flag created?

What was the Confederate flag like?

What is the color of the president's flag?

What flag is hoisted when powder is taken on board?

What is the color of the quarantine flag?

What is the meaning of a flag reversed?

What is the flag of truce? What does the expression mean, to "strike the flag?"

How are flags hoisted in case of mourning? What is "dipping the flag?"

When and why have stars been added to the flag?

Washington

BIRTH—Virginia, February 22, 1732.

PARENTS—Well-to-do farmers.

EDUCATION—Limited to elementary subjects. Acquired by self-study a fine knowledge of mathematics and surveying and knowledge along general lines.

PROFESSION—Public surveyor.

MILITARY CAREER—Began at age of 19. Won admiration and respect in an eminent degree in contest with French and Indians.

REVOLUTION—Prior to Revolution he sympathized with the patriots, but counseled moderation and urged war as last resort. 1774—Elected to Continental Congress and chosen commander-in-chief of the American forces. Served throughout Revolution. Details of his campaign constitute story of Revolution. Rare skill and patience brought results.

PRESIDENT—1789. Chosen as president. Served two terms. Solved some of the most important problems ever presented to American government.

1. Adjustment of important diplomatic difficulties with England and France.
2. Establishment of a national mint.
3. Chartering of the first bank of the United States.
4. Assumption by the government of the national debt.
5. Admission of certain states.

MARRIAGE—1759. Married Mrs. Martha Custis. From the close of French and indian wars to Revolution managed his estates and became one of the wealthiest men in United States.

CHARACTER—Thoughtful and studious nature. Rare tact and judgment. "First in war, first in peace, and first in the hearts of his countrymen."

DEATH—1799. Death occurred from illness brought on by long exposure in the saddle.

BURIAL—Location.

"The preservation of the sacred fire of liberty and the destiny of the republican model of government are justly considered as deeply, perhaps as finally, staked on the experiment intrusted to the hands of the American people."

—From Washington's First Inaugural Address, April 30, 1789.

Thirteen Colonies

School work too frequently is a monotonous grind to the teacher as well as the pupil. A little variety in the way of illustrative work, outline work, queer queries and other devices can be used successfully in connection with almost every subject and will inspire the pupils and change what otherwise might prove drudgery to the teacher into a happy milestone. To get away from the ordinary we suggest that the teacher this year in the study of the Thirteen Colonies have a chart prepared as outlined for the Administrations.

We present you herewith a suggestive chart for the study of Massachusetts and one quite as interesting can be made for each colony. The supplementary material furnished by the NEW PRACTICAL REFERENCE LIBRARY added to the information supplied by the regular text will enable any one to prepare interesting work.

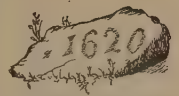
The hundreds of questions suggested by the illustrations will keep the pupils busy and the answers will furnish the groundwork for a thorough understanding of this period of our history. The chart is not supposed to contain the information to answer the questions so much as to suggest the questions and prove a nucleus for memorizing answers.

SUGGESTIVE QUESTIONS.

Why was the (Cradle of Liberty) so styled?
When was the first printing press set up in America?
What was the first newspaper published in America?
Who was the first settler of Boston?
What city is known as the Hub of the Universe?
Why was Boston styled "The Athens of America"?
For what was the Boston Elm noted?
What was the sobriquet of Faneuil Hall?
Name two causes of Salem witchcraft,—three events, two results?
What was some of the early money used in Massachusetts?
What was the nature of the government established by the Pilgrim Fathers?
In what ship did they come to America? What was the number of emigrants? How many houses were erected by them?
What now marks the place where the Pilgrims landed?
Why were the persons who come over in the Mayflower styled Pilgrims?
Who were among the leaders of the Pilgrims? Who the first governors? What do you know of their growth? Their sufferings? Their independence?
What inscription is upon the original Plymouth Rock?
Who is the author of the poem written in honor of the landing of the Pilgrim Fathers?

The books which help you most are those which make you think the most. The hardest way of learning is by easy reading; every man that tries it finds it so.

MASSACHUSETTS

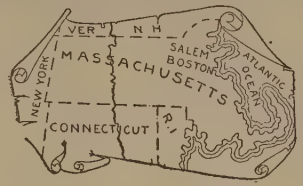


PLYMOUTH ROCK

"What sought they thus afar?
Bright jewels of the mine?
The wealth of seas? the spoils of war?
They sought a faith's pure shrine."

Outline.

Time - Dec. 21, 1620.
Place - Plymouth.
Why so named?
People - Pilgrims
Leaders - Bradford-Carver.
Character - Industrious
Wanderings.
Number - 102.
No. of families - 19.
Suffering
Object - Religious freedom.
Ship - Mayflower
No. of houses - 20.
Governors - Carver - Bradford.
First Thanksgiving.
Growth - Very slow
Independence



ELM TREE

SALEM WITCHCRAFT

Time - 1692.
Place - Salem, Mass.
Causes
Believed possessed of the Devil.
Sold themselves to do his bidding.
Events
Prisons filled.
Fifty-five tortured into confession!
Twenty put to death.
Results
Showed the superstition of the times.
Decreased the spirit of intolerance.

PILGRIM MONUMENT

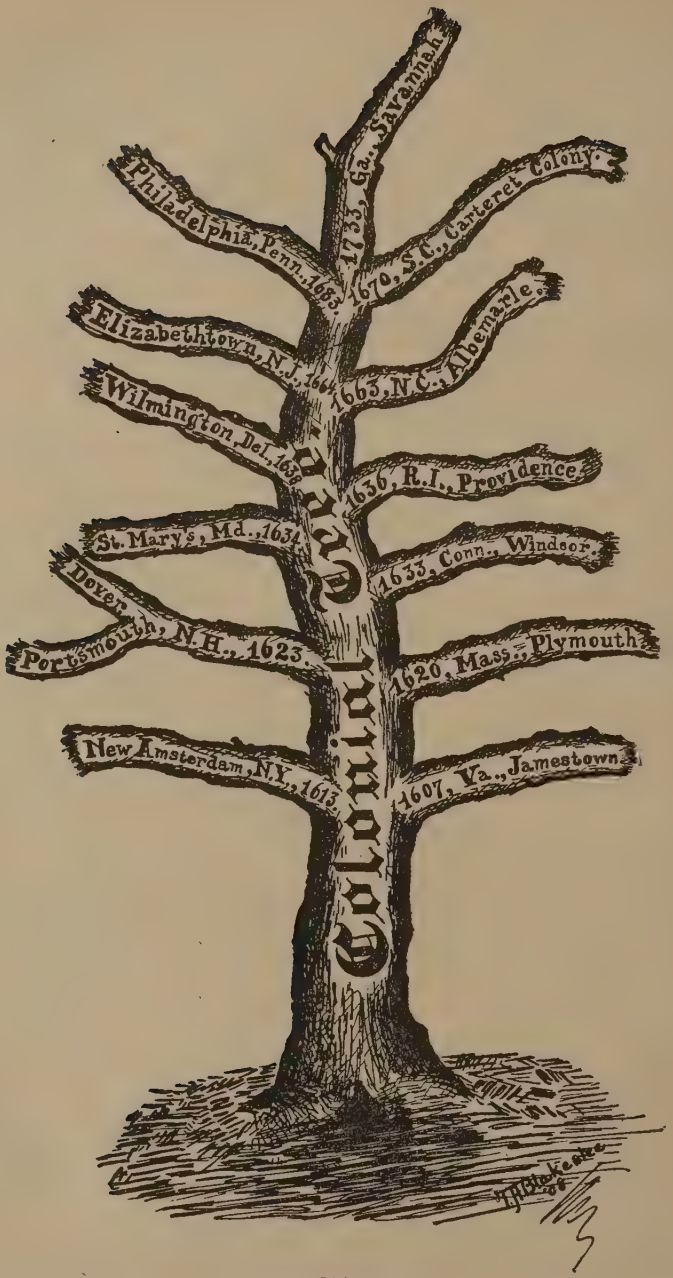
HUB OF THE UNIVERSE

MAY-FLOWER

PINE TREE SHILLING

FANEUIL HALL
"CRADLE OF LIBERTY"

Roach


Colonial
1733, Ga., Savannah
1670, S.C., Carteret Colony
1663, N.C., Albemarle
1636, R.I., Providence
1633, Conn., Windsor
1620, Mass., Plymouth
1607, Va., Jamestown
1613, New Amsterdam, N.Y.
1623, Portsmouth, N.H.
Dover
1634, St. Mary's, Md.
1638, Wilmington, Del.
1664, Elizabethtown, N.J.
1682, Philadelphia, Penn.

EXPLORATIONS

1400 | 1500 | 1600 | 1700

INDIANS

Nations — **Tribes**

Catawbas, Uchees, Cherokees, Natchez

Sioux

Huron-Iroquois: Hurons, Eries

Mobilians: Creeks, Seminoles, Choctaws, Chickasaws

Iroquois (Six Tribes): Mohawks, Oneidas, Onandagas, Cayugas, Senecas, Tuscaroras

Algonquins: Chippewas, Menomenees, Miamis, Sacs, Foxes, Kickapoos, Abenaquis, Narragansetts, Pequods, Massachusetts, Mohegans, Delawares, Powhattans, Shawnees

92 Columbus discovers West Indies
98 Columbus discovers American Continent
99 Amerigo Vespucci visits America
12 Ponce De Leon visits Florida
13 Balboa reaches Pacific Coast
20 Cortez conquers Mexico
28 De Narvaez explores Florida
39 De Soto visits America
41 De Soto discovers Mississippi River
65 St. Augustine founded by Melendez

SPANISH

97 John Cabot discovers Newfoundland
98 Sebastian Cabot explores American Coast
76 Frobisher visits Labrador
79 Drake explores Pacific Coast
83 Gilbert's voyage
84-87 Raleigh attempts to settle Roanoke Island
2 Gosnold's voyage
7 Settlement at Jamestown
20 Puritans settle at Plymouth
34 Maryland settled by Catholics

ENGLISH

24 Verrazzani explores Atlantic Coast
34 Cartier explores St. Lawrence
42 Roberval visits Canada
64 Huguenots in Florida
98 La Roche in Nova Scotia
4 De Monts founds Port Royal
8 Champlain founds Quebec

FRENCH

9 Hudson explores Hudson R.
14 May and Block explorations
14 New Amsterdam founded

DUTCH

Contemporaneous History

15 John Huss burned
20 Field of the Cloth of Gold
29 Joan Arc raises siege of Orleans
21 Diet of Worms
32 Battle of Lutzen
48 Treaty of Westphalia
55 War of the Roses
30 Augsburg Confession
56 Turks defeated at Belgrade
40 Order of Jesuits founded
66 London Fire
69 Ferdinand marries Isabella
54 Siberia discovered
71 Cossacks subdued
80-84 Inquisition
87 Mary of Scots beheaded
Peace of Ryswick 97
92 Ferdinand takes Granada
88 Spanish Armada
Peace of Carlowitz 99

COLONIES

1600 — 1700 — 1775

VIRGINIA
7 Settlement at Jamestown
8 John Smith governor
19 Slavery introduced
19 Legislative Assembly
24 Overthrow of London Co.
29 Sir John Harvey
Gov. Berkeley 42
44 Indian Massacre
75 Bacon's Rebellion 93
51 Navigation Acts
77 Proprietary Government
Settlers - English Adventurers Motive - Wealth Livelihood - Agriculture

MARYLAND
34 First settlement at St. Marys
49 Toleration Act
Settlers - Roman Catholics Motive - Religion
15 Proprietary government
91 Royal Province
Livelihood - Agriculture and Manufacturing

NORTH CAROLINA
53 First settlement from Virginia
63 Grant to Proprietors
Settlers - Refugees and Huguenots Motive
90 Sothel's Rebellion
11 Coree War
91 Union of Carolinas
29 Separation
- Agriculture and Political Strife Livelihood - Rice, Tar and Turpentine

William and Mary's College founded
32 Birth of Washington
Virginia Resolutions 65

NEW JERSEY
23 Settled by Dutch
32 Ft. Nassau destroyed by Ind.
64 Elizabethtown settled
65 Slavery introduced
73 Division East and West Jersey
88 Charter annulled
2 Reunion of Jerseys
38 Separated from New York
Settlers - Dutch and Quakers Motive - Agriculture Livelihood - Agriculture

NEW YORK
38 Delaware settled by Swedes
9 Hudson sails up Hudson River
13 New Amsterdam settled
15 Trading post at Manhattan Is.
47 Peter Stuyvesant
64 English Conquest
21 Dutch West India Co. formed
29 Patroon system organized
73 Reconquered by Dutch
74 English Colony
Andros' Administration 75
89 King William's War
90 First Intercolonial Assembly
Settlers - Dutch Motive - Trade Livelihood - Furs

DELAWARE
82 Added to Pennsylvania
Settlers - Swedes and Quakers Motive - Agriculture Livelihood - Agriculture
3 Becomes separate colony
32 Gov. Crosby
44 Negro Plot
97 Capt. Kidd Piracy
French and Indian War 54
First Colonial Congress 65

CONNECTICUT
33 Hartford settled
62 New Charter Granted
Pequot War 36
48 New Haven Republic organized
89 Charter hidden
1 Yale College founded
Settlers - Puritans and Colonists Motive - Agriculture and Religion Livelihood - Agriculture and Manufacturing

RHODE ISLAND
36 Settled by Roger Williams
Newport founded 39
47 Code of laws enacted
87 Joined to New York
Settlers - Dissenters Motive - Religion Livelihood - Agriculture and Fishing

MASSACHUSETTS
20 Settlement at Plymouth
23 New Hampshire settled
30 Capital at Boston 47 Public Schools Est.
Harvard College founded 38
75 King Philip's War
Loses Charter 84 92 Witchcraft
39 First printing press at Cambridge
90 King William's War
90 First paper money
Settlers - Puritans Motive - Religion Livelihood - Farming and Fishing

NEW HAMPSHIRE
79 Separate Col.
98 Absorbed by Massachusetts
Settlers - Colonists from Massachusetts Motive - Trade Livelihood - Agriculture and Fishing
41 Finally separated
2 Queen Anne's War
44 King George's War
Quebec captured 59
45 Capture of Louisburg
French and Indian War 54

SOUTH CAROLINA
70 Settled by English
71 Slavery Intro. 80 Charleston founded
Settlers - Refugees Motive- Agriculture and Religion Livelihood- Cotton, Rice and Silk
2 Expedition against St. Augustine
6 Spanish invasion
29 Royal Province

PENNSYLVANIA
81 Settled 92
82 Ind. Treaty
Settlers - Quakers Motive - Religion Livelihood - Agriculture, Mining and Manufacturing
18 Death of Penn
Penn dispossessed
1 Charter of Privileges
French and Indian War 54
Braddock's defeat 55

GEORGIA 53 Royal Province
33 Settled at Savannah
39 War with Spaniards
Settlers - Scotch and Poor Motive- Philanthropy Livelihood - Cotton

REVOLUTION

1775	1776	1777	1778	1779	1780	1781
Lexington and Concord April 19 Smith Parker Pitcairn	Dorchester Heights March 4 Washington	Princeton Jan. 3 Washington Mawhood	Naval Battle March 7 Randolph Yarmouth	Kettle Creek Feb. 14 Pickens Tories	Monk's Corner April 14 Huger Tarleton	Cowpens Jan. 17 Morgan Tarleton
Ticonderoga May 10 Allen Arnold	Sullivan's Island June 28 Clinton Moultrie Parker	Fort Schuyler Aug. 3 Herkimer St. Leger	Monmouth June 28 Washington Clinton	Vincennes Feb. 25 Clark Hamilton	Capture of Charleston May 12 Clinton Lincoln Cornwallis	Guilford Courthouse March 15 Greene Cornwallis
Crown Point May 12 Warner	Long Island August 27 Putnam Clinton	Bennington Aug. 16 Stark Baum Warner Breyman	Wyoming Massacre July 3 Indians Butler	Brier Creek March 3 Ashe Prevost	Waxhaw Creek May 29 Buford Tarleton	Hobkirk's Hill April 25 Greene Rawdon
Bunker Hill June 17 Prescott Howe	Harlem Plains Sept. 16 Knowlton Leitch Leslie	Brandywine Sept. 11 Washington Howe	Newport Aug. 29 Greene	Stony Point July 16 Wayne	Hanging Rock Aug. 6 American Sumter Loyalists	Fort Watson April 26 Marion Lee
Capture of Montreal Nov. 13 Montgomery Prescott	White Plains Oct. 28 Washington Howe	Bemis Heights Sept. 19 Gates Burgoyne	Light Horse captured Sept. 28 Baylor Grey	Elmira Aug. 29 Sullivan Indians	Camden Aug. 16 Gates Cornwallis	Jamestown Ford July 4 Wayne Cornwallis
Great Bridge Dec. 9 Dunmore	Fort Washington Nov. 16 Magaw Howe	Germantown Oct. 4 Washington Howe	Massacre Oct. 15 Pulaski's Infantry Ferguson	Paul Jones' Victory Sept. 23 Richard Serapis	Fishing Creek Aug. 18 Sumter Tarleton	Fort Griswold Sept. 6 Ledyard Arnold
Quebec Dec. 31 Arnold Montgomery	Trenton Dec. 26 Donop Washington Rall	Saratoga Oct. 7 Gates Burgoyne	Cherry Val. Massacre Nov. 10 Indians Butler	Savannah Oct. 9 Lincoln D'Estaing Prevost	King's Mountain Oct. 7 Campbell Ferguson	Eutaw Springs Sept. 8 Greene Stewart
		Fort Mercer Oct. 23 Greene Donop	Savannah Seized Dec. 29 Campbell		Blackstock Nov. 20 Sumter Tarleton	Siege of Yorktown Sept. 8 to Oct. 19 Washington Cornwallis
Troops Enlisted: 37,363	Troops Enlisted: 89,761	Troops Enlisted: 68,720	Troops Enlisted: 51,046	Troops Enlisted: 44,275	Troops Enlisted: 43,079	Troops Enlisted: 29,340
Miscellany: Washington Commander in Chief First Continental Currency	Miscellany: Evacuation of Boston Declaration of Independence	Miscellany: Congress adopts Flag Articles of Confederation	Miscellany: Alliance with France Charleston Burned	Miscellany: Depreciation of Federal Money	Miscellany: First Bank Chartered England Declares War with Holland	Miscellany: Federal Union Established Bank of North America Chartered

AMERICANS BRITISH INDECISIVE

ADMINISTRATIONS

		1789	1797	1801	1809	1817
EXECUTIVE	President	WASHINGTON	ADAMS	JEFFERSON	MADISON	
	Leaders in Cabinet	Jefferson Hamilton	Pickering Wolcott	Madison Dearborn	Gallatin Dallas	
	Important Messages & Papers	Farewell Address		First Written Message		
JUDICIAL	Chief Justice	Jay	Ellsworth	Marshall		
	Decisions			Marbury and Madison		
LEGISLATIVE	Pres. of Senate	Adams	Jefferson	Burr Clinton	Clinton Gerry	
	Speaker of House	Muhlenberg Trumbull Dayton	Sedgwick	Macon Varnum	Clay Cheves	
	Number of Members	Senate 26 House 65	Senate 30 House 105	Senate 32 House 141	Senate 34 House 181	
	Leaders	Madison Gerry	Clay	J. Q. Adams	Calhoun Webster	
	Laws	Revenue Bill Naturalization Law	Alien and Sedition Acts	Embargo Act	Non Intercourse Act	
IMPORTANT EVENTS	Wars	Indian Whisky Rebellion	Quasi	Tripoli	Indian War of 1812	
	Inventions	Cotton Gin Nail Cutter	Locomotive Plow	Steamboat Blow Pipe Steam Dredge	Breech-loading Rifle Printing of Cotton Goods	
	Acquisition Territories			Louisiana		
	Foreign Relations	Treaty with England Treaty with Spain	Treaty with France		Treaty of Ghent	
	Slavery	Petition to Abolish sent to Congress		Slave Trade Abolished		
	Deaths	Allen Franklin Hancock Jones	Henry Washington	Hamilton Sam'l Adams Moultrie	Clinton Gerry	
	States Admitted	Vermont Kentucky Tennessee		Ohio	Louisiana Indiana	
	Miscellany	Census Capitol Moved		Lewis & Clark Expedition West Point Academy	Washington Burned	
	Foreign Events	French Revolution		Milan Decree	Revolution in Venezuela Mexican Uprising	

ADMINISTRATIONS

	1817	1825	1829	1837	1841	1845	1849
Pres.	MONROE	ADAMS	JACKSON	VAN BUREN	HARRISON TYLER	POLK	
Cabn't	Adams Calhoun	Clay Rush	Van Buren Livingston Berrien	Forsyth	Webster Calhoun	Buchanan	
Messages	Monroe Doctrine		Bank Message				
Chief Just.			Taney				
Decisions	Dartmouth College						
Pres. Senate	Tompkins	Calhoun	Calhoun	Johnson		Dallas	
Speak. House	Clay Taylor Barbour	Taylor Stevenson Bell Polk		Hunter	White Jones	Davis Winthrop	
No. Mems	Senate 48 House 213	Senate 48 House 213	Senate 48 House 240	Senate 48 House 240	Senate 52 House 223	Senate 52 House 223	
Leaders	Clay Webster Jackson	Van Buren Buchanan	Webster Clay Hayne Benton	Wright Adams		Wilmot Corwin	
Laws	Tenure of Office Act		U. S. Bank Bill Vetoed Force Act	Sub-Treasury Bill	Annexation Bill	Wilmot Proviso	
Wars	Seminole		Black Hawk Seminole	Seminole	Dorr Rebellion	Mexican	
Inventions	Shoe Pegs Velocipede	Planing Mach. Passenger Train	Colt's Revolver Typewriter Chloroform used	Friction Match Elec. Telegraph	Telegraph Line Use of Ether	Sewing Machine Hoe Ptg. Press	
Acquisitions	Florida						
For'n Rel.	Treaty with Canada		Treaty with Brazil		Webster-Ashburton	Treaty of Hidalgo	
Slavery	Missouri Compromise	Slavery abolished in N. Y.	Anti-Slavery in New England	Anti-Slavery Party	Growth of Abolition	Wilmot Proviso	
Deaths	Decatur Boone Stark	Adams Jefferson	Jay Monroe Madison Marshall	Black Hawk	Channing Jackson	J. Q. Adams	
States Admit.	Mississippi Illinois Alabama Maine Missouri	Georgia	Michigan Arkansas		Texas Florida	Iowa Wisconsin	
Misc. Lany	First Steam Voyage across the Atlantic	First Threshing Machine	Rise of American Literature	Indians removed to Indian Ter.	Postage Stamps	Discovery of Gold in Calif.	
For'n Events	Mexican Revolution		Independence of Mexico Independence of Texas	Canadian Reb. Victoria Crown	Federal Union in C. A. Dissolved		

ADMINISTRATIONS

	1849	1853	1857	1861	1869	1877	1881
Pres.	TAYLOR FILLMORE	PIERCE	BUCHANAN	LINCOLN JOHNSON	GRANT		HAYES
Cabin't	Webster Meridith	Marcy Davis	Cass Dix	Seward McCulloch	Fish Sherman Brewster		Evarts Sherman
Messages			Revolutionary Message	Emancipation Proc. Amnesty			
Chief Just.				Chase	Waite		
Decisions							
Pres. Senate			Breckenridge	Hamlin	Colfax Wilson		Wheeler
Speak. House	Cobb	Boyd Banks	Orr Pennington	Grow Colfax	Blaine Kerr Randall		
No. Mems	Senate 66 House 237	Senate 66 House 237	Senate 72 House 243	Senate 72 House 243	Senate 76 House 293		Senate 76 House 293
Leaders	Douglas Davis	Cass Stephens	Seward Cameron	Stevens Morrell Sumner Crittenden	Morton Schurz Wilson Trumbull		Edmunds Bland
Laws	Omnibus Bill	Kansas-Nebr. Bill		Income Tax Law Civil Rights Bill	Salary Act		Anti-Chinese Bill
Wars		Border Warfare	J. Brown's Raid Mormon Insur'n	Civil War	Modoc Sioux		Nez Perce
Inventions		Type Setting Machine	Sleeping Car Atlantic Cable	Repeating Rifles Gatling Guns	Fire Extinguisher Telephone Crematory		Steam Heating Phonograph
Acquisitions		Gadsden		Alaska			
For'n Rel.	Clayton-Bulwer Treaty	Treaty with Japan	Treaty with China	Burlingame Treaty	Treaty of Washington		New Chinese Treaty
Slavery	Fugitive Slave Law	Underground Railway	Dred Scott Decision	Secession of States 13th Amendment	Ku Klux Klan Colored Senator		Negro Exodus
Deaths	Calhoun Webster Clay		Irving Mann	Tyler Van Buren Jackson Buchanan	Greeley Pierce Prentice Farragut		Bryant Young
States Admit.	California		Minnesota Kansas Oregon	West Virginia Nevada Nebraska	Colorado		
Miscellany		Lopez Expedition	Secession	Atlantic Cable Laid	Pacific Railroad Chicago Fire Weather Bureau		Electric Light Life Sv. Station
For'n Events	Cuban Revolution	Ostend Manifesto	Three Year War in Mexico	Fenian Raid in Canada Wars in South America	Franco-German War		Famine in Brazil

ADMINISTRATIONS

	1881	1885	1889	1893	1897	1905	1909
Pres.	GARFIELD ARTHUR	CLEVELAND	HARRISON	CLEVELAND	MC KINLEY ROOSEVELT		TAFT
Cabn't	Blaine Lincoln	Bayard Fairchild	Blaine Elkins	Olney Carlisle	Root Day Wilson Hay	Taft Root	
Messages				Venezuela	Panama Canal	Trusts	
Chief Just.			Fuller				
Decisions				Income Tax	Northern Securities		
Pres. Senate		Hendricks	Morton	Stevenson	Hobart Roosevelt	Fairbanks	Sherman
Speak. House	Keifer Carlisle		Reed Crisp	Reed	Henderson	Cannon	
No. Mems	Senate 88 House 332	Senate 88 House 332	Senate 90 House 357	Senate 90 House 357	Senate 90 House 386	Senate 90 House 386	Senate 92 House 391
Leaders	Pendleton Conklin	Logan Gorman	Mc Kinley Sherman	Wilson Hill	Dingley Williams Hanna Hoar	Lodge Tillman	
Laws	Civil Service Chinese Bill	In's. Com. Act Dawes' Bill	International Copyright Law	Sherman Law Wilson Bill	Chinese Exclusion Bill	Pure Food Law Meat Insp. Bill	
Wars	Apaches Captured	Anarchist Riots	Sioux War	Coal Strikes Railroad Strikes	Spanish American Philippine	Springfield Riot	
Inventions	Flying Machine		Natural Gas used	Niagara Falls Harnessed	Liquefied Air Wireless Telegraphy	Aeroplane	
Acquisitions					Hawaiian Islands Porto Rico Guam Philippines Samoa		
For'n Rel.	Treaty with China	Extrad. Treaty C-Bayard Treaty	Samoan Treaty Recip. Treaty		Arbitration Treaty Hay-Pauncefote Treaty	Hay-Varilla Treaty	
Slavery							
Deaths	Garfield Longfellow Emerson	Sheridan Arthur Seymour Grant	Fremont		Jos. Jefferson Mc Kinley	Harper Hoar Cleveland	
States Admit.		Wash. Mont. N.and S Dakota	Idaho Wyoming	Utah		Oklahoma	
Misc'l any	Washington Monument	Earthquake in Charleston	Johnstown Food	World's Fair at Chicago	Baltimore Fire Hague Peace Conference	Panama Canal	
For'n Events		Exclusion Act in China	Brazil Repub. Boxer Rebellion	Cuban Rev. Hawaiian Rev.	Cuba under protection of U. S. Boer War	Russo-Japanese War	

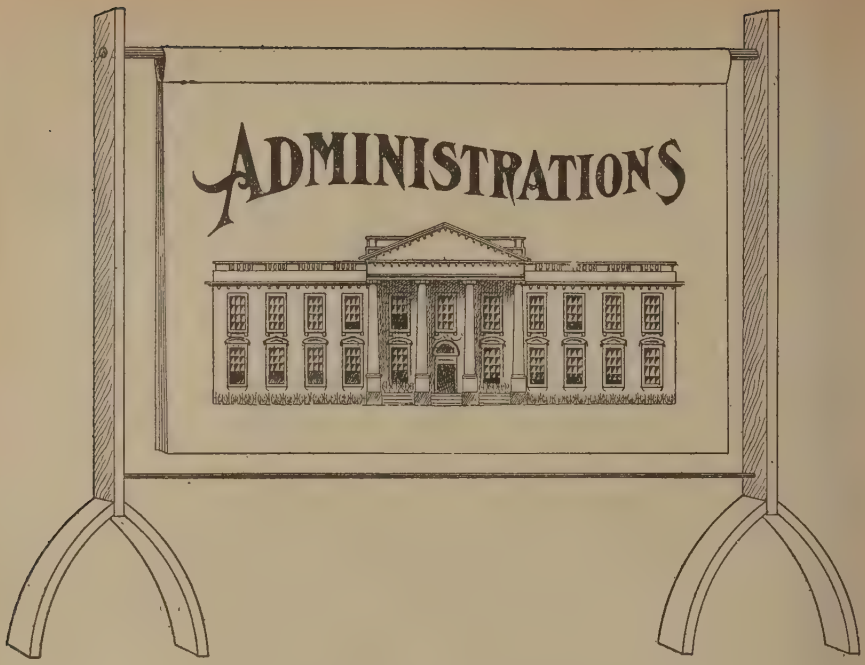
CIVIL WAR

1861	1862	1863	1864	1865
Fort Sumter Apr. 14 Anderson Beauregard	Mill Spring Jan. 19 Thomas Zollicoffer	Galveston Jan. 1 Renshaw Magruder	Olustee Feb. 20 Seymour Finnegan	Fort Fisher Jan.16 Porter Butler Whiting
Sewell's Point May 20 Ward Virginia Troops	Fort Donelson Feb. 16 Grant Buckner	Arkansas Post Jan. 11 Mc Clernand	Fort De Russy Mar. 14 Franklin Taylor	Old Town Creek Feb. 20 Cox
Fairfax Ct. Hse. June 1 Tompkins	Pea Ridge Mar. 7 Curtis Van Dorn	Bisland Apr. 12 Banks Taylor	Sabin Cross Rds. Apr. 8 Ransom	Fayetteville Mar. 8 Kilpatrick Hampton
Philippi June 3 Kelley Porterfield	Naval Battle Mar. 9 Monitor Merrimac	Port Gibson May 1 Mc Pherson	Wilderness May 5-6 Grant Lee	Averasboro Mar. 16 Sherman Hardee
Big Bethel June 10 Pierce Hill Magruder	Shiloh Apr. 6-7 Grant Johnston	Chancellorsville May 2 Hooker Lee	Spottsylvania May 10-12 Grant Lee	Bentonsville Mar. 19 Sherman Johnston
Romney Bridge June 11 Wallace Johnston	Williamsburg May 5 Mc Clellan Johnston	Suffolk May 3 Peck Longstreet	Resaca May 13 Sherman Johnston	Fort Steadman Mar. 25 Grant Lee
Carthage July 5 Sigel Jackson	Fair Oaks May 31 Mc Clellan Johnston	Champion Hills May 16 Grant Pemberton	Cold Harbor June 3 Grant Lee	Five Forks Apr. 1 Sheridan Lee
Rich Mountain July 11 Rosecrans Pegram	Cross Keys June 8 Fremont Ewell	Winchester June 15 Milroy Ewell	Petersburg June 18 Burnside Lee	Selma Apr. 2 Wilson Forrest
Carrick's Ford July 12 McClell'n Morris Garnett	Mechanicsville June 26 Mc Clellan Jackson Hill	Gettysburg July 1-3 Meade Lee	Atlanta Sept. 1 Sherman Hood	Petersburg Apr. 2 Grant Lee
Bull Run July 21 Mc Dowell Jackson	Gaines' Farm June 27 Porter Hill	Vicksburg July 4 Grant Pemt'n Johnston	Winchester Sept. 19 Sheridan Early	Richmond Apr. 3 Grant Davis
Wilson's Creek Aug. 10 Lyon Sigel McCulloch	Malvern Hills July 1 Porter Jackson	Port Hudson July 9 Banks Gardner	Fisher's Hill Sept. 22 Sheridan Early	Appomattox Apr. 9 Grant Lee
Carnifex Ferry Sept. 9 Rosecrans Floyd	Cedar Mountain Aug. 8 Banks Jackson	Chickamauga Sept. 19 Rosecrans Bragg	Cedar Creek Oct. 19 Sheridan Early	
Ball's Bluff Oct. 21 Baker	Antietam Sept. 17 Mc Clellan Lee	Bristow's Station Oct. 15 Meade Lee	Little Osage Rv. Oct. 25 Curtis Pleasanton Price	
Springfield Oct. 24 Fremont Thompson	Corinth Oct. 3 Rosecrans Van Dorn	Lookout Mt. Nov. 23 Hooker Bragg	Franklin Nov. 30 Schofield Hood	
Belmont Nov. 7 Grant Polk	Fredericksburg Dec. 13 Burnside Lee	Chattanooga Nov. 23 Grant Bragg	Nashville Dec. 16 Thomas Hood	
Dranesville Dec. 20 Mc Call Stuart	Murfreesboro Dec. 31 Rosecrans Bragg	Knoxville Dec. 4 Burnside Longstreet	Savannah Dec. 26 Sherman	
Miscellaneous Events: Davis President of Confederacy; England proclaimed neutrality	Iron Clad Oath Confiscation Proclamation Lee's Proclamation First issue of Greenbacks	Emancipation Proclamation Mexico made an Empire Gettysburg Speech	Grant made Lieut.-Gen'l Maximilian Emperor of Mexico Civil Wars in S. America	Thirteenth Amendment Freedman's Bureau Assassination of Lincoln Amnesty Proclamation

UNION CONFEDERATE INDECISIVE

THE ORIGINAL THIRTEEN COLONIES

Colony	Date	Place	Motive	Settlers	Livelihood	Government
Virginia	1607	Jamestown	Wealth	Eng. Adventurers	Com. Tob. Slaves	C.C.-R.-Prop.-R.
New York	1613	New York	Trade	Dutch	Furs	C.C.-Prop.-R.
Massachusetts	1620	Plymouth	Religion	Separatists. Puritans	Agri. Fishing	Dem.-Char.-R.
N. Hampshire	1623	Portsmouth	Trade	Col. from Mass.	Agri. Fish. Lum.	Prop.-Prov.-R.
Maryland	1634	St. Marys	Religion	Roman Catholics	Agri. Mfg. Men.	Prop.-R.-Prop.
Connecticut	1635	Windsor	Agri. & Rel.	Colonists. Puritans	Agri Mfg	Dem.-Char.-R.
Rhode Island	1636	Providence	Religion	Dissenters	Agri. Fishing	Dem.-Char.-R.
Delaware	1638	Wilmington	Agriculture	Swedes. Quakers	Agriculture	Dem.-Prov.-Prop.
N. Carolina	1640-63	Albemarle Sd.	Ag. & Pol. Strife	Refugees. Huguenots	Rice, Tar, Turp.	Prop.-Roy.
New Jersey	1664	Elizabethtown	Agriculture	Dutch. Quakers	Agriculture	Prop.-R.
S. Carolina	1670	Charleston	Agri. Rel. & Pol.	Refugees. Huguenots	Cotton, Rice. Silk	Prop.-R.
Pennsylvania	1682	Philadelphia	Religion	Quakers	Ag. Mfg. Min.	Prop.-R.-Prop.
Georgia	1733	Savannah	Philanthrophy	Scotch & Poor	Cotton	Prop.-R.



The Administrations

How many times have you taken your class over this period of the History? How many of them can name three events of each administration? How many can tell in whose administration the war of 1812 occurred? The Embargo Act? The purchase of Louisiana? The admission of Texas? The Panic of 1873? The Omnibus Bill? The completion of the Atlantic Cable? The Thirteenth Amendment? The erection of Liberty Enlightening the World? The many other interesting events which concern the most important period of American History?

Why not make an exception this year? Why not do something special? Why not get out of the rut of text-book routine? The History class will devote half of the six months' term to this period of History. You may have nine pupils in this class. Make twenty-seven charts—one representing each administration. That means that each pupil must make one chart per month to complete the series. Have a cabinet maker or one of your pupils prepare a stand after the fashion of the illustration, secure twenty-seven sheets of cardboard 12x18 inches for permanent charts. Secure a supply of common paper for rough sketches to be used in the daily recitation. After outlining to the pupils what you expect them to accomplish during this time—that during the three months they are not only to become familiar with the most important period in American History but that they will leave a monument of their finishing work in History that will be prized by succeeding teachers as well as pupils and will prove a more practical chart than the machine-made charts which cost so dearly.

Require each pupil to sketch with pencil everything that suggests itself of interest in Washington's administration and bring to the recitation the next day, compare notes, make suggestions and develop on the blackboard an ideal arrange-

ment. In this manner design an administration each day for nine days, each pupil will then be assigned a special chart to prepare, the selection can be made by casting lots. During the remainder of the first month spend the recitation period in completing and perfecting the charts assigned and see that nine effective charts are produced illustrating well the important events of the first nine administrations.

These charts should then be attached to the support by a cloth hinge, a neat cover design should be supplied. The next few recitations should be devoted to a review of the work accomplished, fixing permanently in the minds the important events illustrated. We supply a list of suggestive questions which may be asked concerning Johnson's administration, all of which information is supplied from the chart and should be answered with the chart before the class but not open to this administration. After this review the chart should be opened to Johnson's administration and the illustrations carefully studied. This should be continued for each administration and the interest created and the information secured will amply repay any efforts made by the teacher. These special accomplishments are the distinguishing features between the successful and non-successful teacher. The page illustration is simply suggestive of one administration and we have selected one of the least eventful, so that the teacher may not feel that she will have any trouble in having ample material for this work. The wealth of material supplied by the NEW PRACTICAL REFERENCE LIBRARY is apparent and it is merely a question of a wise selection.

What were the three important features of the President's idea of reconstruction?

What additional requirements were imposed by Congress?

What is an appropriate epitaph for Lincoln's tomb?

In what year was Nebraska admitted into the Union?

What immense domain was added to the United States during this administration?

Name four important laws passed while Johnson was President?

How many men took part in the Grand Review? How long did it last? How did the soldiers march? When did it occur?

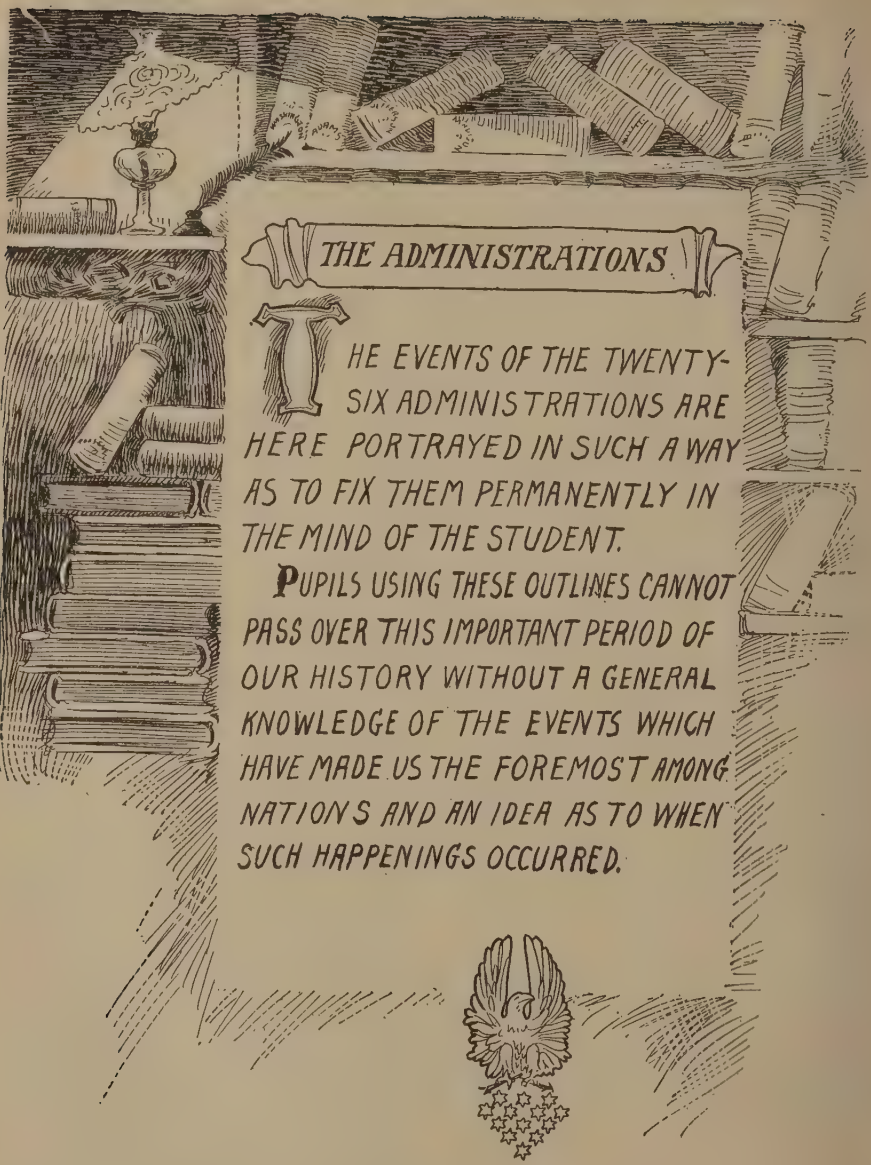
What ended the dream of French dominion in the New World?

The northern office seekers who went South at the close of the Civil War were designated by what title?

What two words express the thought of the Thirteenth Amendment? Of the Fourteenth?

What vessel was used in successfully laying the Atlantic Cable? Name some interesting facts as to the size of the vessel? The successful accomplishing of this enterprise was due to what personage?

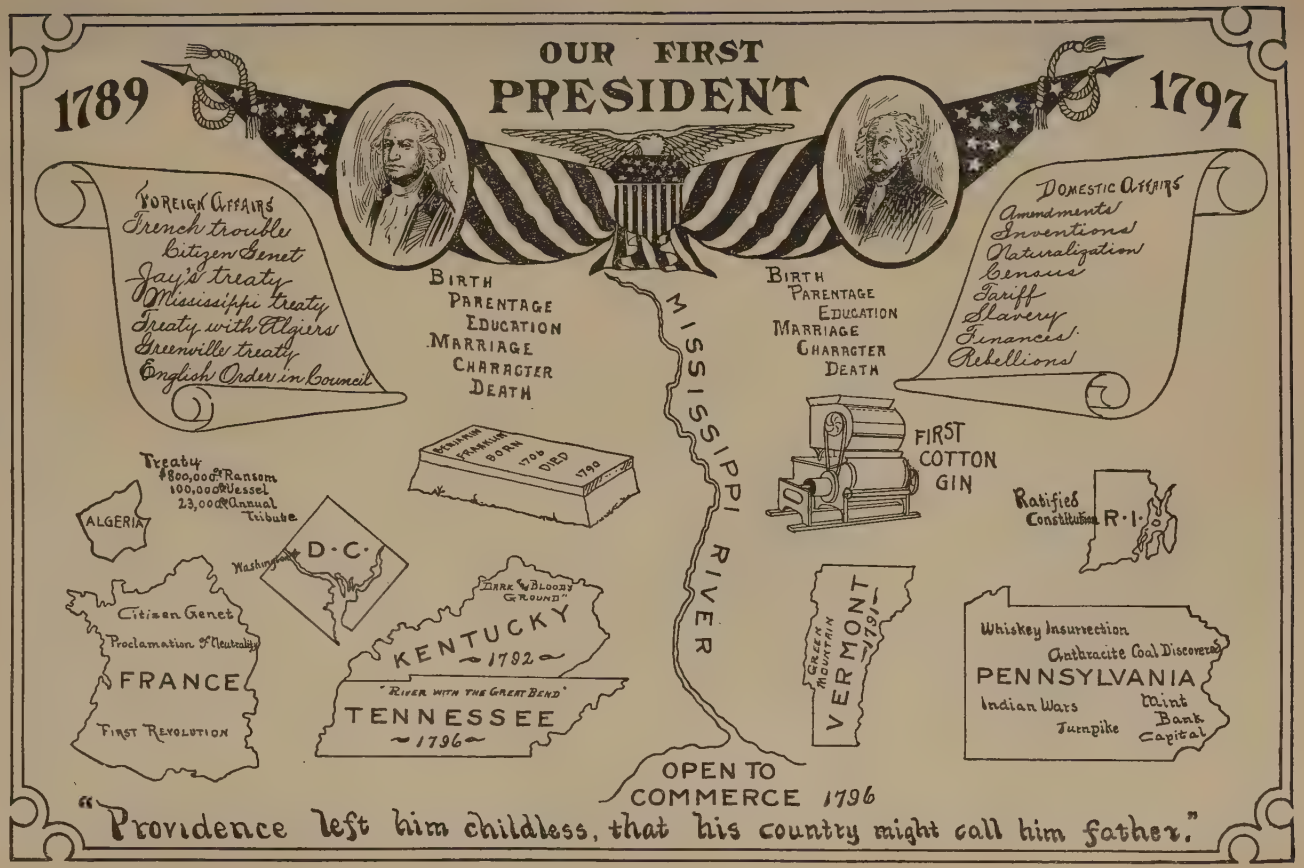
Independent thinking has given us the present, and will forever continue to make tomorrow better than today. The right to think is inalienable, or man is a machine; thought is life, or the human soul is a thing. —*Patrick.*



THE ADMINISTRATIONS

THE EVENTS OF THE TWENTY-SIX ADMINISTRATIONS ARE HERE PORTRAYED IN SUCH A WAY AS TO FIX THEM PERMANENTLY IN THE MIND OF THE STUDENT.

PUPILS USING THESE OUTLINES CANNOT PASS OVER THIS IMPORTANT PERIOD OF OUR HISTORY WITHOUT A GENERAL KNOWLEDGE OF THE EVENTS WHICH HAVE MADE US THE FOREMOST AMONG NATIONS AND AN IDEA AS TO WHEN SUCH HAPPENINGS OCCURRED.


OUR FIRST
PRESIDENT
1789
1797
FOREIGN AFFAIRS
French trouble
Citizen Genet
Jay's treaty
Mississippi treaty
Treaty with Algiers
Greenville treaty
English Order in Council
BIRTH
PARENTAGE
EDUCATION
MARRIAGE
CHARACTER
DEATH
BIRTH
PARENTAGE
EDUCATION
MARRIAGE
CHARACTER
DEATH
DOMESTIC AFFAIRS
Amendments
Inventions
Naturalization
Census
Tariff
Slavery
Finances
Rebellions
MISSISSIPPI RIVER
BENJAMIN FRANKLIN
BORN 1706
DIED 1790
FIRST
COTTON
GIN
Treaty
$800,000 Ransom
100,000 Vessel
23,000 Annual Tribute
ALGERIA
D·C·
Washington
Citizen Genet
Proclamation of Neutrality
FRANCE
First Revolution
"DARK & BLOODY GROUND"
KENTUCKY
~1792~
"RIVER WITH THE GREAT BEND"
TENNESSEE
~1796~
GREEN MOUNTAIN
VERMONT
~1791~
Ratified Constitution
R·I·
Whiskey Insurrection
Anthracite Coal Discovered
PENNSYLVANIA
Indian Wars
Turnpike
Mint
Bank
Capital
OPEN TO
COMMERCE 1796
"Providence left him childless, that his country might call him father."

ADAMS' ADMINISTRATION

1797

1801

ALIEN LAW

THE PRESIDENT COULD EXPEL FROM THE COUNTRY ANY FOREIGNER WHOM HE DEEMED INJURIOUS TO THE UNITED STATES

SEDITION LAW

ANY ONE LIBELING CONGRESS, THE PRESIDENT, OR THE GOVERNMENT, COULD BE FINED OR IMPRISONED

DEFENSE

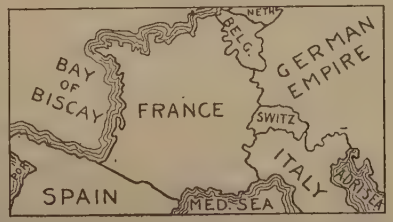
MILLIONS FOR — BUT NOT

ONE CENT — FOR — TRIBUTE

FIRST IN PEACE

FIRST IN WAR — OF — AND FIRST IN

THE HEARTS — HIS COUNTRYMEN

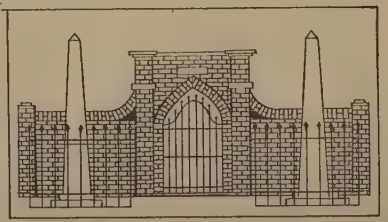


JOHN ADAMS SUCCEEDED WASHINGTON AS PRESIDENT AND DID NOT CHANGE HIS POLITICS TO AMOUNT TO MUCH.

HE MADE A GOOD RECORD AS CONGRESSMAN BUT LOST IT AS PRESIDENT LARGELY BECAUSE OF HIS EGOTISM.

HE SEEMED TO THINK THAT IF HE NEGLECTED TO OIL THE GEARING OF THE SOLAR SYSTEM ABOUT SO OFTEN IT WOULD STOP RUNNING.

—BILL NYE—



1801 JEFFERSON'S ADMINISTRATION 1809

TRIPOLITAN WAR

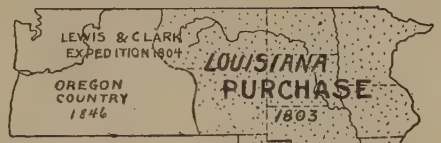
TIME-1801-5
1801-TRIPOLI DECLARED WAR
1803-NAVAL FORCE IN MED. SEA.
PHIL FOUND & CAPTURED
CREW TREATED AS SLAVES
1804-DECATUR CAPT. & BURNED PHIL.
COMPREBLE BOMBARDED TRIPOLI
1805-TROUBLE CEASED
BASHAW GLAD TO MAKE TREATY

FULTON'S CLERMONT 1807

WEE HAWKEN
FAMOUS DUELING GROUND. HAMILTON & HIS SON FELL HERE. BURR-HAMILTON-1804-

ORDERS IN COUNCIL

NAPOLEON'S MILAN DECREE
MILAN



PURCHASE OF LOUISIANA

FROM-NAPOLEON
BY WHOM-LIVINGSTON & MONROE
CAUSE-
1-EXTREMITY OF NAPOLEON
2-TO PREVENT ENGLAND GETTING IT.
3-TO MAKE THE UNITED STATES A RIVAL OF ENGLAND
OBJECT-
1-TO OPEN THE MISS. RIVER TO THE WESTERN COMMERCE
2-TO EXTEND THE TERR. OF THE U.S.
TERMS-ABOUT 15,000,000 DOLLARS
INCIDENTS-
RESULTS-
1-TERR. OF THE U.S. MORE THAN DOUBLED
2-STRENGTHENED SLAVE TERR. AND GAVE RISE TO THE MO COMPROMISE

FOREIGN AFFAIRS

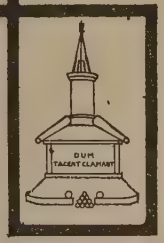
1806 ENGLAND ORDERS IN COUNCIL
NAPOLEON-MILAN DECREE
EMBARGO ACT "TERREPIN POLICY"
CHESAPEAKE FIRED ON
1809-NON-INTERCOURSE LAW PASSED

DOMESTIC AFFAIRS

1801-FIRST WRITTEN MESSAGE TO CONGRESS
ARMY & NAVY REDUCED.
EXCISE TAKEN FROM WHISKEY
1808-SLAVE TRADE PROHIBITED.

JAMES MADISON

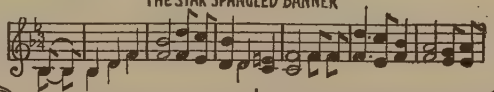
1809 — 1817



MONUMENT, NEW ORLEANS

AMERICAN SOLDIER

THE STAR SPANGLED BANNER



OH, SAY CAN YOU SEE BY THE DAWN'S EARLY LIGHT WHAT SO PROUDLY WE HAILED

HARTFORD CONVENTION

I-TIME
III-PLACE
IIII-MEMBERS
IV-RESOLUTIONS
V-RESULTS

DESTRUCTION OF THE GUERRIERE BY THE CONSTITUTION

WAR OF 1812

I-TIME
III-CAUSE
IIII-ACTS & EVENTS (INFLUENCING)
IV-GENERAL IN CHIEF
V-CAMPAIGNS & EVENTS
VI-RESULTS

SEAL OF INDIANA

GERRY-MANDERING

SEAL OF LOUISIANA

STATES ADMITTED

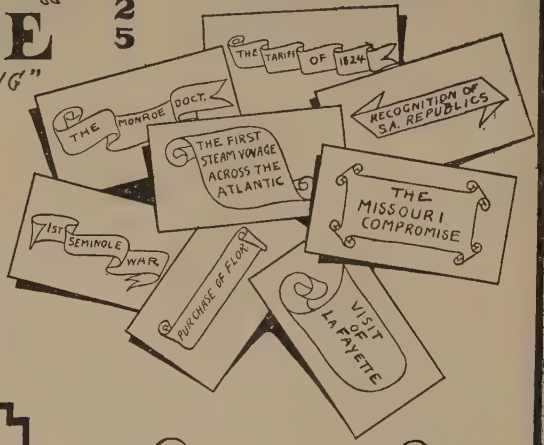
PEACE FOR THIRTY YEARS

1817 JAMES MONROE 1825

"ERA OF GOOD FEELING"

FLORIDA PURCHASE
TIME - 1819
AREA - 59000 SQ. MI.
FROM - SPAIN
COST - $5,000,000
OCCASION FOR?

IMPORTANT EVENTS



Missouri Compromise

TIME 1820
AUTHORS
STATEMENT
RESULT

LAFAYETTE AT THE TOMB OF WASHINGTON

"THE NATION'S GUEST"

Monroe Doctrine

TIME - 1823
CAUSE
STATEMENT
RESULT

J·Q·ADAMS' ADMINISTRATION

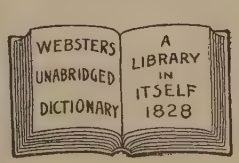
1825 — 1829

"THE WALKING VOCABULARY"
"THE OLD MAN ELOQUENT"

"THIS IS THE LAST OF EARTH"
"TALENT, OPPORTUNITY, EFFORT, RESULTS."

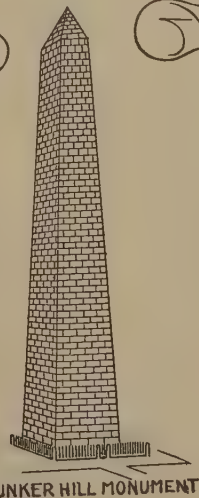
JEFFERSON
JULY 4, 1826.

ADAMS
JULY 4, 1826.



IMPORTANT EVENTS

1825 - BUNKER HILL
ERIE CANAL OPENED
1826 - DEATH OF JOHN ADAMS
DEATH OF JEFFERSON
DISAPPEARANCE OF MORGAN
1827 - FIRST RAILWAY
1828 - BILL OF ABOMINATIONS
WEBSTERS DICTIONARY



NEW POLITICAL PARTIES

NATIONAL REPUBLICAN
I - TIME - 1825 - 35
II - PRINCIPLES
PUBLIC IMPROVEMENT
PROTECTIVE TARIFF
NATIONAL BANK
III - LEADERS
CLAY
ADAMS
WEBSTER
IV - PRESIDENT -
ADAMS.

ANTI MASONIC
II - TIME - 1827
III - PLATFORM
SUPPRESSION OF MASONRY.
OPPOSITION TO SECRET SOCIETIES
III - PRESIDENTIAL CANDIDATE
- WILLIAM WIRT -
IV - INFLUENCE
CONTROLLED N.Y. ELECTIONS -

THE FIVE IMPORTANT EVENTS
1829
JACKSON
OLD HICKORY
1837
SPOILS SYSTEM
"TO THE VICTORS BELONG THE SPOILS"
ROTATION IN OFFICE
KITCHEN CABINET
POCKET VETOES
ANTI SLAVERY MOVEMENT
NEW ENGLAND ANTI SLAVERY SOCIETY ORGANIZED
"THE LIBERATOR"
GARRISON
U·S·BANK
CHARTER VETOED
SPECULATION
SPECIAL CIRCULAR
STATE BANKS
"Pet Banks"
THOS BENTON
NULLIFICATION
RESISTANCE OF NATIONAL LAW
FORCE ACT
GAG RULE
THE "BLOODY BILL"
THE FIRST HARVESTER
CHICAGO IN 1832
OTHER EVENTS
INDEPENDENCE OF MEXICO
MORMONISM ESTABLISHED
DEATHS OF MONROE & MADISON
TREATY WITH BRAZIL
TEXAS DECLARES INDEPENDENCE
GREAT FIRE IN NEW YORK
CHOLERA VISITS U.S.
ARK. & MICH. ADMITTED
LITERARY
RISE OF AMERICAN LITERATURE AND CHEAP NEWSPAPERS
BRYANT-WHITTIER
HAWTHORNE-IRVING
LONGFELLOW-COOPER
EMERSON-HOLMES
-POE-
N.Y. SUN FOUNDED
N.Y. HERALD FOUNDED
SEMINOLE AND BLACK-HAWK WARS
ALAMO

VAN BUREN'S ADMINISTRATION

·1837-1841·

THE GREAT
FINANCIAL PANIC
···· OF 1837 ····
THE
SUBTREASURY SYSTEM
· ESTABLISHED ·

THE ALTON RIOTS
·1837·

THE CANADIAN REBELLION
·1837·

CHEROKEE INDIANS REMOVED TO INDIAN TERRITORY
·1838·

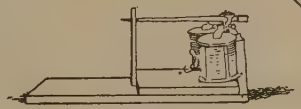
PROCESS OF VULCANIZING RUBBER DISCOVERED IN
·1839·

FIRST NORMAL SCHOOL OPENED IN MASS.
·1839·

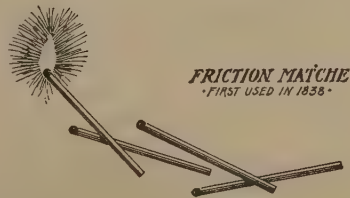
SUBTREASURY BILL PASSED
·1840·

6TH CENSUS-POP-17,069,453
·1840·

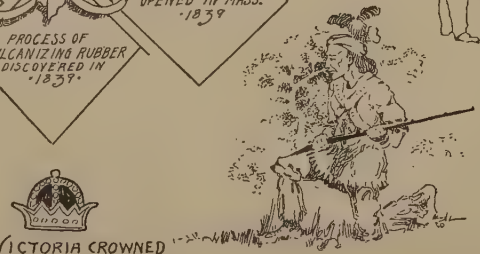
MAGNETIC TELEGRAPH
PATENTED-1837·



FIRST PHOTOGRAPH TAKEN IN AMERICA···
·1839·

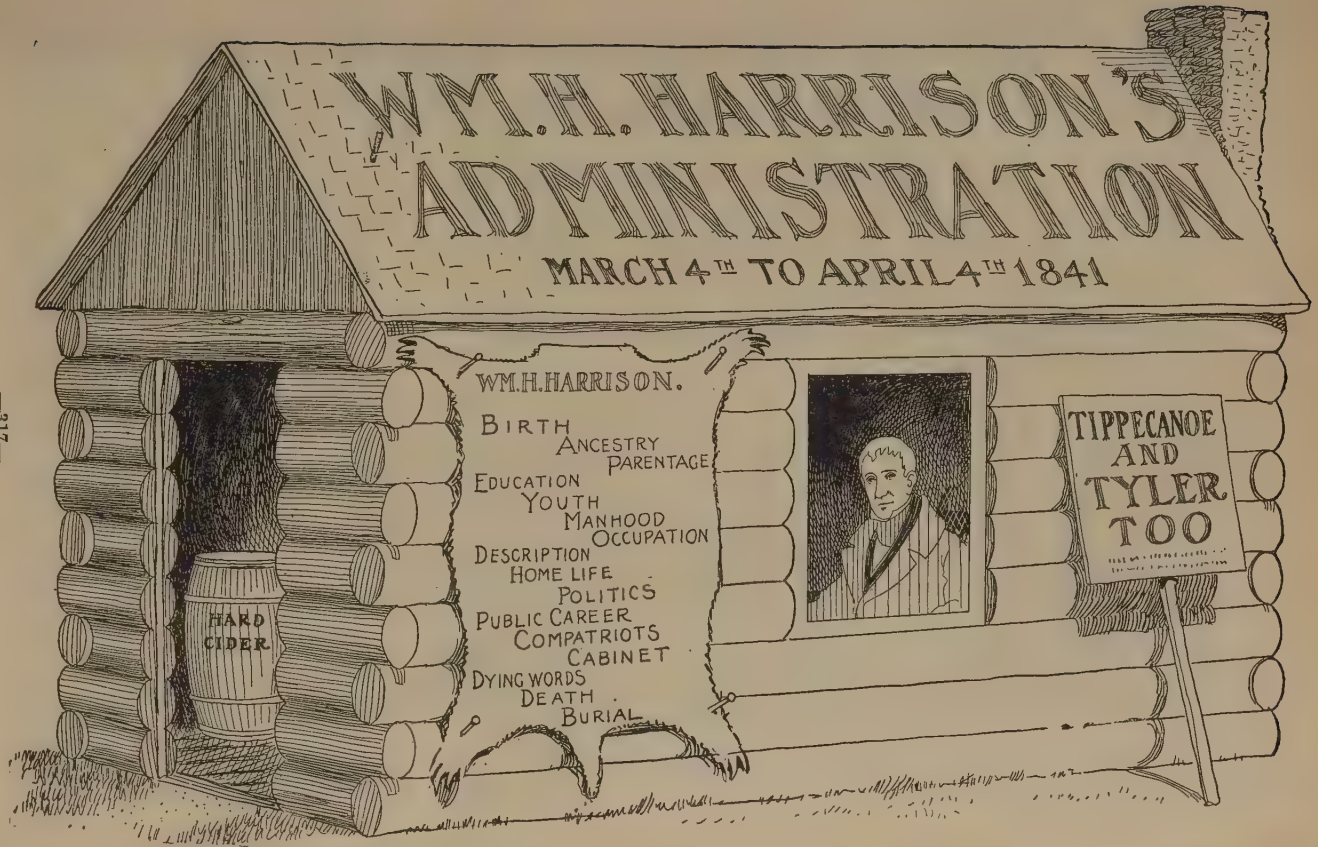


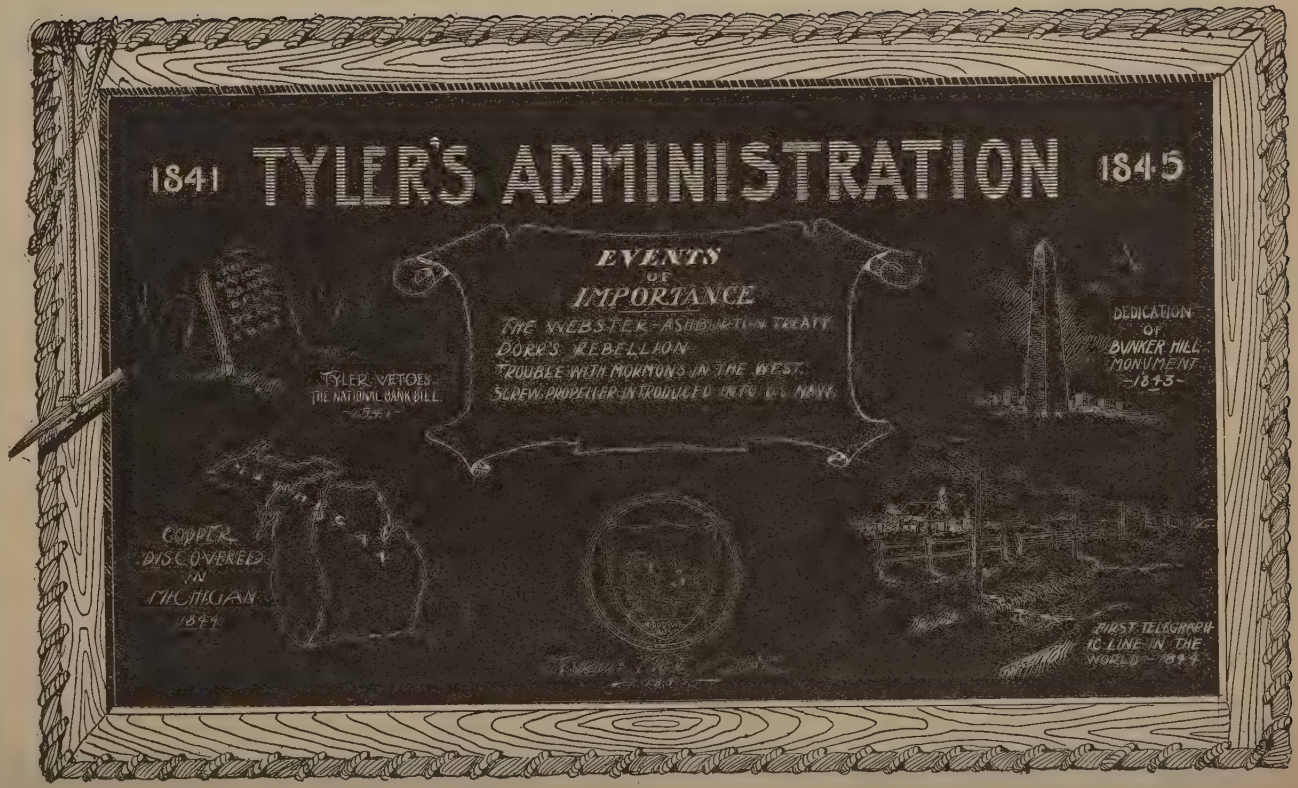
FRICTION MATCHES
·FIRST USED IN 1838·



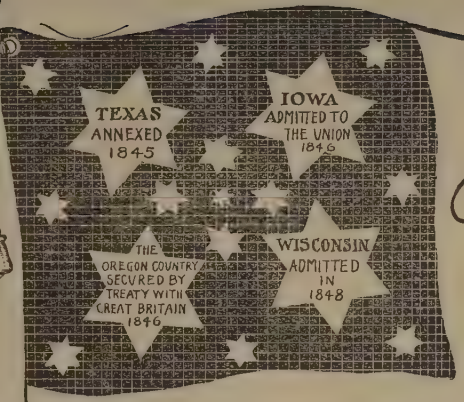
THE SEMINOLE WAR·

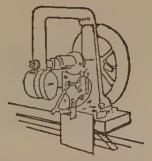
VICTORIA CROWNED


WM. H. HARRISON'S
ADMINISTRATION
MARCH 4TH TO APRIL 4TH 1841
WM. H. HARRISON.
BIRTH
ANCESTRY
PARENTAGE
EDUCATION
YOUTH
MANHOOD
OCCUPATION
DESCRIPTION
HOME LIFE
POLITICS
PUBLIC CAREER
COMPATRIOTS
CABINET
DYING WORDS
DEATH
BURIAL
HARD CIDER
TIPPECANOE AND TYLER TOO


1841 TYLER'S ADMINISTRATION 1845
EVENTS OF IMPORTANCE
THE WEBSTER-ASHBURTON TREATY
DORR'S REBELLION
TROUBLE WITH MORMONS IN THE WEST.
SCREW PROPELLER INTRODUCED INTO U.S. NAVY.
TYLER VETOES THE NATIONAL BANK BILL
COPPER DISCOVERED IN MICHIGAN 1844
DEDICATION OF BUNKER HILL MONUMENT -1843-
FIRST TELEGRAPH LINE IN THE WORLD - 1844

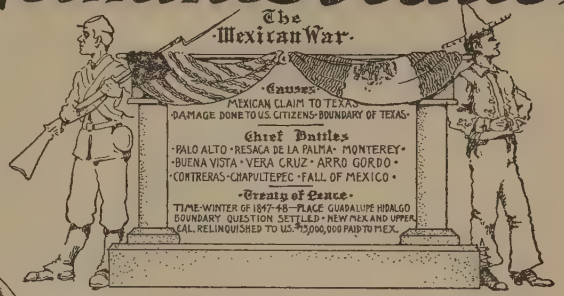
·1845 Polks— ·1849·
Administration


TEXAS ANNEXED 1845
IOWA ADMITTED TO THE UNION 1846
THE OREGON COUNTRY SECURED BY TREATY WITH GREAT BRITAIN 1846
WISCONSIN ADMITTED IN 1848



SEWING MACHINE
INVENTED BY HOWE-1845·

The ·Mexican War·



·Causes·
·MEXICAN CLAIM TO TEXAS·
·DAMAGE DONE TO U.S. CITIZENS·BOUNDARY OF TEXAS·

·Chief Battles·
·PALO ALTO ·RESACA DE LA PALMA· MONTEREY·
·BUENA VISTA · VERA CRUZ · ARRO GORDO ·
·CONTRERAS·CHAPULTEPEC ·FALL OF MEXICO ·

·Treaty of Peace·
TIME-WINTER OF 1847-48—PLACE GUADALUPE HIDALGO
BOUNDARY QUESTION SETTLED · NEW MEX. AND UPPER CAL. RELINQUISHED TO U.S.—$15,000,000 PAID TO MEX.

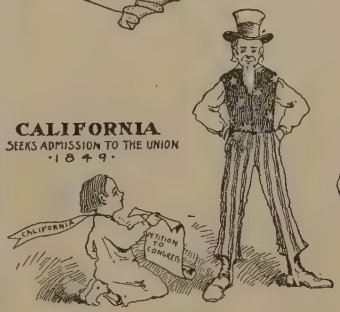
·HAPPENINGS·

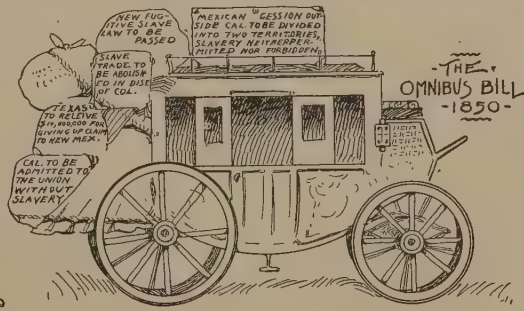
NAVAL SCHOOL FOUNDED AT ANNAPOLIS-1845-
SMITHSONIAN INSTITUTE ESTABLISHED-1846-
1ST OPERATION PERFORMED BY USE OF ETHER-1846-
HOE CYLINDER PRINTING PRESS INVENTED 1847-
SALT LAKE CITY FOUNDED -1849-

TAYLOR'S ADMINISTRATION

1849

1850

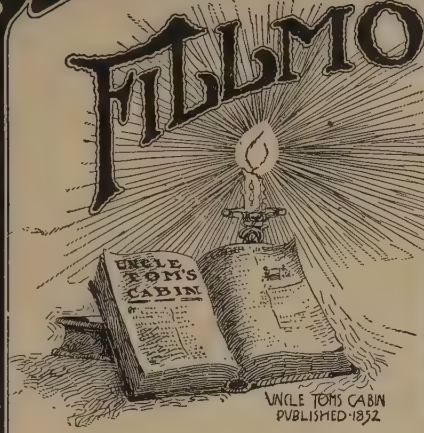



NEW FUGITIVE SLAVE LAW TO BE PASSED
SLAVE TRADE TO BE ABOLISHED IN DIST OF COL.
TEXAS TO RECEIVE $10,000,000 FOR GIVING UP CLAIM TO NEW MEX.
CAL. TO BE ADMITTED TO THE UNION WITHOUT SLAVERY
MERICAN CESSION OUTSIDE CAL. TOBE DIVIDED INTO TWO TERRITORIES, SLAVERY NEITHERPERMITTED NOR FORBIDDEN.

-THE- OMNIBUS BILL -1850-

THE OVERLAND ROUTE TO CALIFORNIA

FILLMORE'S ADMINISTRATION 1850-1853



UNCLE TOMS CABIN PUBLISHED 1852

IMPORTANT EVENTS

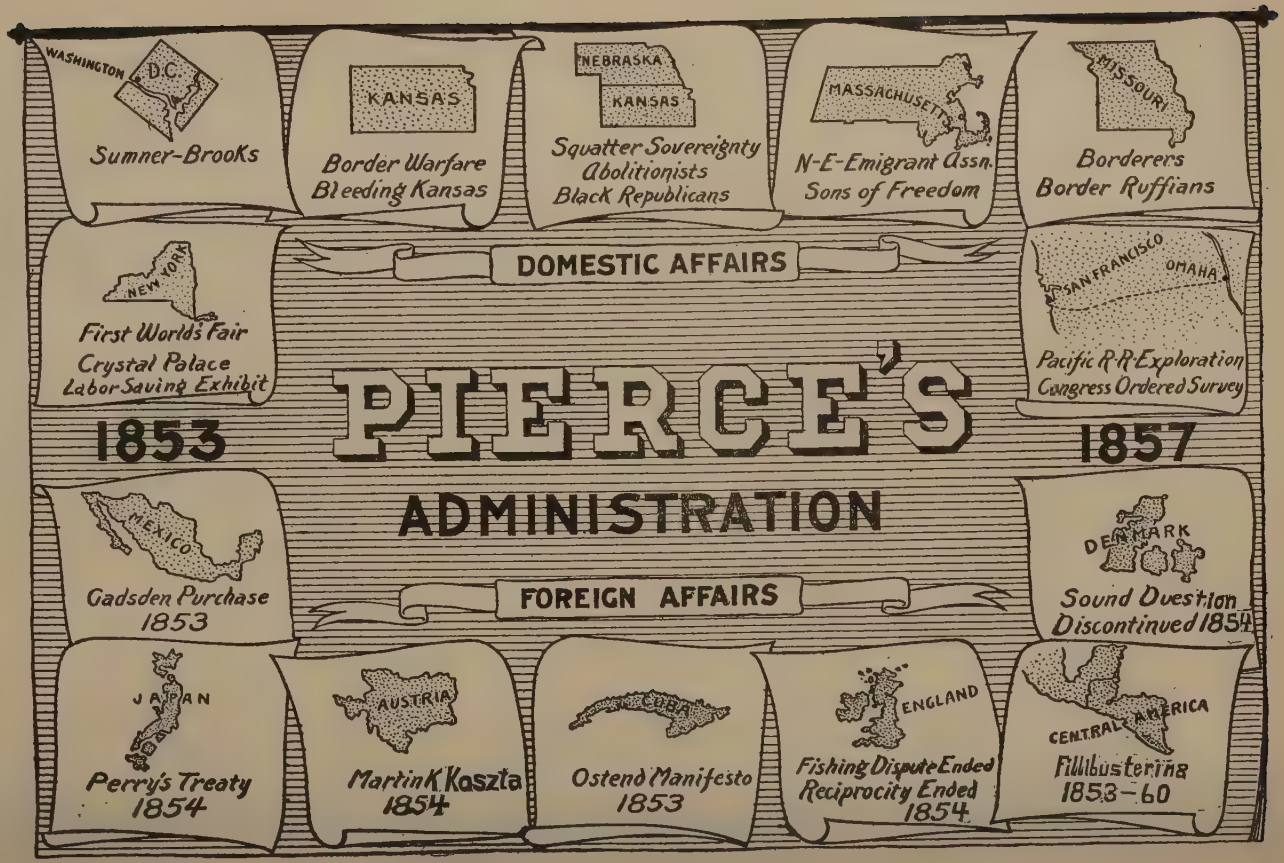
PACIFIC RAILWAY SURVEYS ORDERED 1853
HUNGARIAN PATRIOT KOSSUTH SEEKS AID IN UNITED STATES 1852

MANY ARCTIC EXPEDITIONS SENT OUT

MAINE LAW PASSED (1st TEMPERANCE LAW) 1851

"THE UNDERGROUND RAILWAY"

GUIDING A RUNAWAY NEGRO TO THE NEXT "STATION"


WASHINGTON D.C.
Sumner-Brooks
KANSAS
Border Warfare
Bleeding Kansas
NEBRASKA
KANSAS
Squatter Sovereignty
Abolitionists
Black Republicans
MASSACHUSETTS
N-E-Emigrant Assn.
Sons of Freedom
MISSOURI
Borderers
Border Ruffians
DOMESTIC AFFAIRS
NEW YORK
First Worlds Fair
Crystal Palace
Labor Saving Exhibit
SAN FRANCISCO
OMAHA
Pacific R.R. Exploration
Congress Ordered Survey
PIERCE'S
1853
1857
ADMINISTRATION
MEXICO
Gadsden Purchase
1853
FOREIGN AFFAIRS
DENMARK
Sound Question
Discontinued 1854
JAPAN
Perry's Treaty
1854
AUSTRIA
Martin K. Koszta
1854
CUBA
Ostend Manifesto
1853
ENGLAND
Fishing Dispute Ended
Reciprocity Ended
1854
CENTRAL AMERICA
Fillibustering
1853-60

Buchanan's Administration

1857

1861

MINNESOTA BECOMES A STATE — 1858 —

OREGON ADMITTED TO THE UNION — 1859 —

KANSAS ADMITTED AS A STATE - 1860 -

CONFEDERATE STATES ORGANIZED IN 1861 —

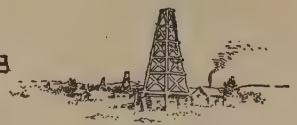
• JOHN BROWN'S RAID AT HARPER'S FERRY • — 1859

• DRED SCOTT DECISION • 1857 •

•• OTHER IMPORTANT EVENTS ••

FINANCIAL PANIC - 1857	COMSTOCK LODE DISCOVERED - 1858
LAYING OF THE ATLANTIC CABLE - 1857	MORMONS AT UTAH OVERPOWERED - 1858
LINCOLN - DOUGLAS DEBATES - 1858	8TH CENSUS - POP. 31,443,321 - 1860

• SECESSION OF SOUTH CAROLINA - 1860 •



• OIL DISCOVERED IN PENNSYLVANIA • 1859 •

LINCOLN'S ADMINISTRATION

NEVADA ADMITTED TO THE UNION-1864

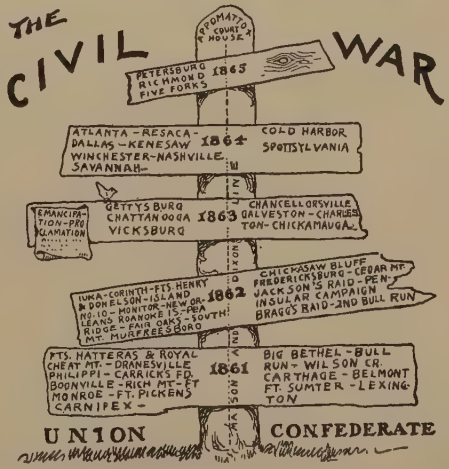
WEST VIRGINIA ADMITTED TO THE UNION-1865

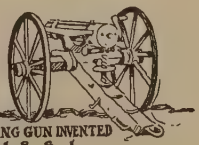
1861 — 1865

VASSAR COLLEGE
·FOUNDED 1861·

THE SIOUX WAR 1862-63

THE CIVIL WAR





GATLING GUN INVENTED
1861

FREE MAIL DELIVERY IN LARGE CITIES ESTABLISHED-1863

·EVENTS·

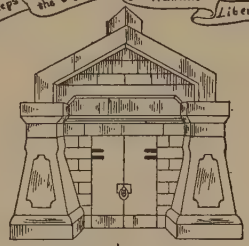
GROUNDS PURCHASED FOR NAT. CEMETERIES-1861
ADDITIONAL TAXES TO PROVIDE FOR WAR-1861
HOMESTEAD LAW-1861
BUREAU OF AGRICULTURE FOUNDED-1862
PAC. RR. & TEL. AUTHORIZED-1862
THE ANTI-POLYGAMY ACT-1862

EVENTS

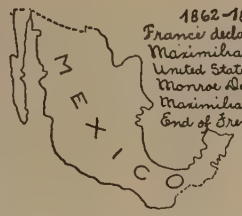
FIRST ISSUE OF GREENBACKS-1862
CONSCRIPTION ACT - 1863
NATIONAL BANK FOUNDED-1863
EMANCIPATION PROCLAMATION-1863
POSTAL MONEY ORDER SYSTEM EST. 1864
THE PHILADELPHIA FAIR-1864

1865 JOHNSON'S ADMINISTRATION 1869

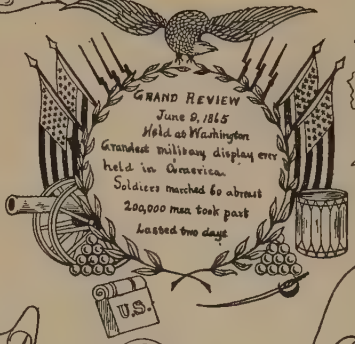
"Here sleeps the Apostle of Human Liberty"



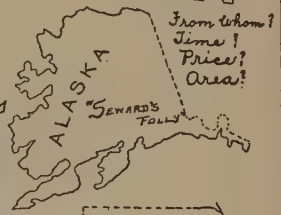
LINCOLN'S TOMB



1862–1867
France declares war.
Maximilian ruler.
United States protest.
Monroe Doctrine
Maximilian shot
End of French dream



GRAND REVIEW
June 9, 1865
Held at Washington
Grandest military display ever held in America.
Soldiers marched 60 abreast
200,000 men took part
Lasted two days



From whom?
Time!
Price?
Area!

NEBRASKA
ADMITTED 1867

Laws
Freedman's Bureau
Civil Rights
Tenure of Office
Amnesty Proclamation

RECONSTRUCTION
President
1 Repudiate Act of Secession
2 Repudiate Confederate debt
3 Ratify XIII Amendment

Congress
1. Repudiate Articles of Secession
2. Ratify XIII & XIV Amts
3. Finally ratify XV Amendment

U.S.

CARPET BAGGERS

Amendments
XIII Anti Slavery
XIV Equal Rights

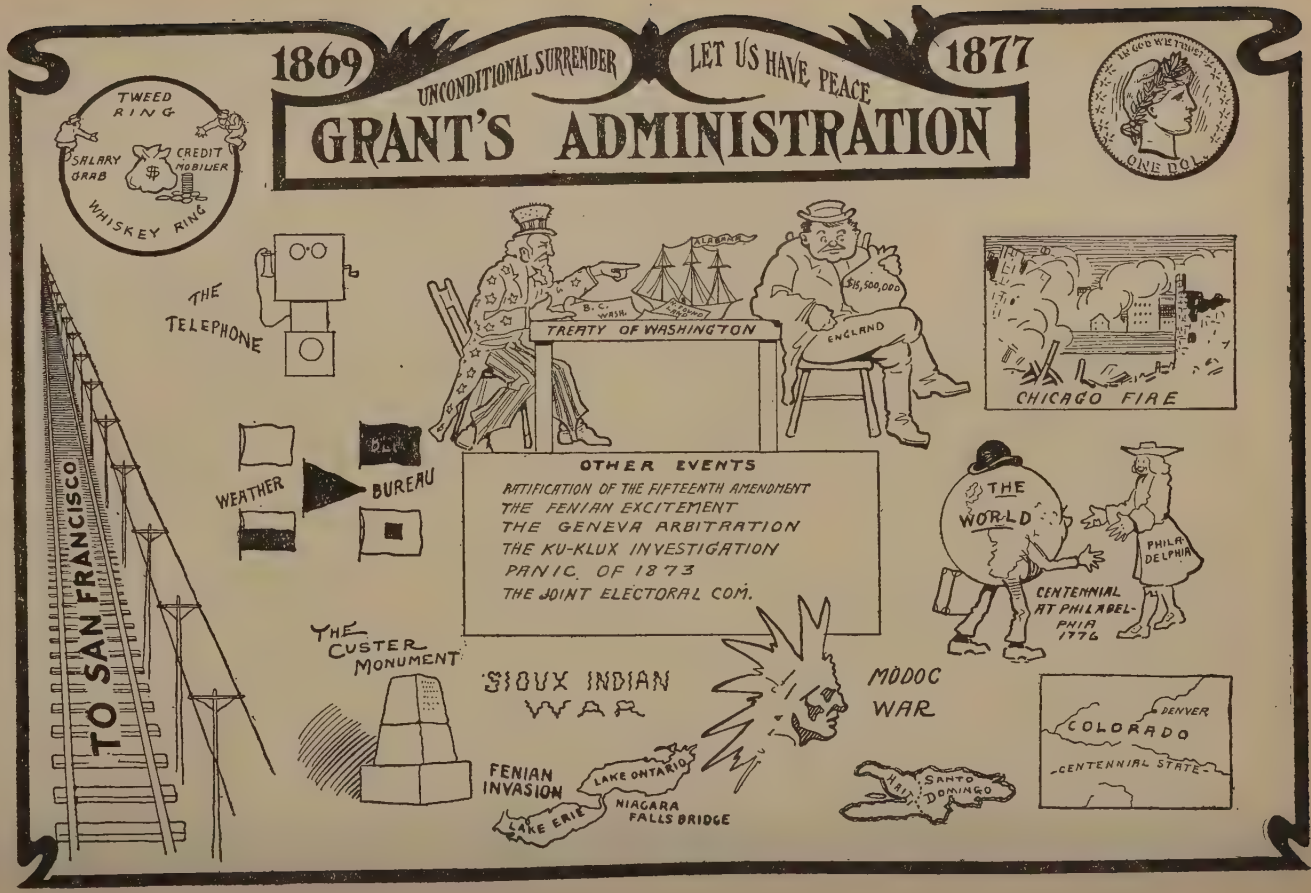
GREAT EASTERN

Launching lasted nearly 5 mo. Cost 60,000£
Length 680 ft. Breadth 118 ft. Height 70 ft. Launched 1858
8 Engines 11,000 Horse power Sold 1885 for $126,000

ATLANTIC CABLE

Success due to energy of Cyrus W. Field
1857 First attempt Cable parted 1858 Second attempt. Success
1865 Great Eastern successfully accomplished the work.

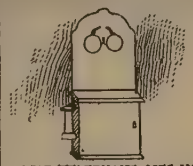
Rossi


1869
UNCONDITIONAL SURRENDER
LET US HAVE PEACE
1877
GRANT'S ADMINISTRATION
TWEED RING
SALARY GRAB
CREDIT MOBILIER
WHISKEY RING
IN GOD WE TRUST
ONE DOL.
THE TELEPHONE
TREATY OF WASHINGTON
B. C.
WASH.
ALABAMA
$15,500,000
ENGLAND
CHICAGO FIRE
WEATHER
BUREAU
OTHER EVENTS
RATIFICATION OF THE FIFTEENTH AMENDMENT
THE FENIAN EXCITEMENT
THE GENEVA ARBITRATION
THE KU-KLUX INVESTIGATION
PANIC OF 1873
THE JOINT ELECTORAL COM.
THE WORLD
PHILA DELPHIA
CENTENNIAL AT PHILADELPHIA 1776
TO SAN FRANCISCO
THE CUSTER MONUMENT
SIOUX INDIAN WAR
MODOC WAR
FENIAN INVASION
LAKE ONTARIO
LAKE ERIE
NIAGARA FALLS BRIDGE
HAYTI
SANTO DOMINGO
DENVER
COLORADO
CENTENNIAL STATE

1877 "He serves his party best who serves his country best" 1881

HAYES' ADMINISTRATION

"THE POLICY PRESIDENT"

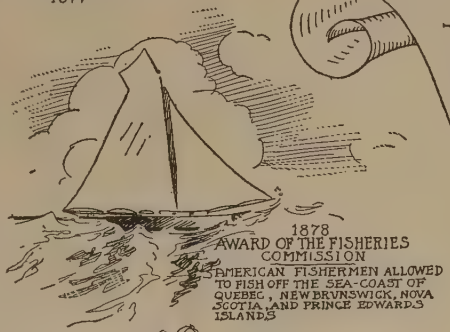


THE TELEPHONE GOES INTO GENERAL USE 1877

ELECTRIC LIGHTING ADOPTED 1877

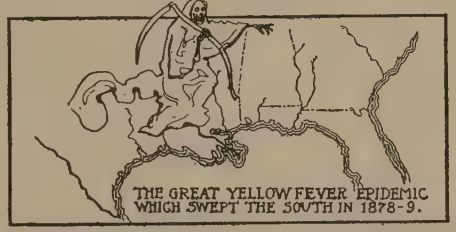
SOME HAPPENINGS DURING "THE BUCKEYE PRESIDENTS" ADMINISTRATION

THE GREAT RAILROAD STRIKE 1877.
CIVIL SERVICE REFORM INTRODUCED.
TROUBLE WITH NEZ-PERCE INDIANS.
GREAT TEMPERANCE MOVEMENT-1878.
DEATH OF Wm CULLEN BRYANT.
LIFE SAVING SERVICE ESTABLISHED 1879.
THE NEGRO EXODUS.
TENTH CENSUS-POP. 50,155,783.



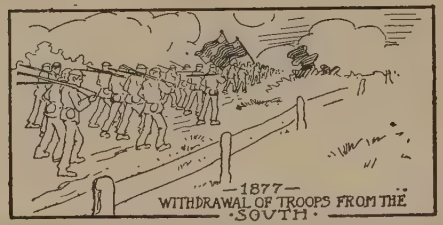
1878
AWARD OF THE FISHERIES COMMISSION
AMERICAN FISHERMEN ALLOWED TO FISH OFF THE SEA-COAST OF QUEBEC, NEW BRUNSWICK, NOVA SCOTIA, AND PRINCE EDWARDS ISLANDS

SILVER MADE A LEGAL TENDER
—1878—



THE GREAT YELLOW FEVER EPIDEMIC WHICH SWEPT THE SOUTH IN 1878-9.

1879
GRANT MAKES A TOUR OF THE WORLD

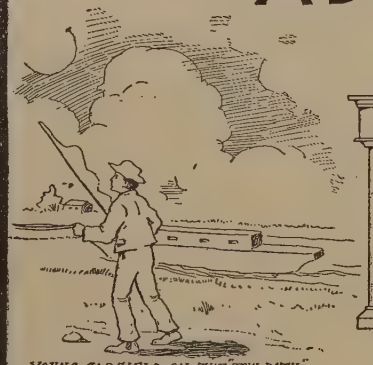


—1877—
WITHDRAWAL OF TROOPS FROM THE SOUTH

"A POUND OF PLUCK IS WORTH A TON OF LUCK"

GARFIELD'S ·1881· ADMINISTRATION

"GOD REIGNS, AND THE GOVERNMENT AT WASHINGTON STILL LIVES"



"YOUNG GARFIELD ON THE TOW-PATH"

EVENTS OF THE BRIEF ADMINISTRATION OF "THE TEACHER PRESIDENT"

DIVISION OF REPUBLICAN PARTY OVER "DISPOSITION OF SPOILS"
PLATT AND CONKLING RESIGN FROM THE SENATE-
·ASSASSINATION OF THE PRESIDENT·
·STAR ROUTE INVESTIGATION·

$364,000 And President's Salary Donated to His Widow.

ASSASSINATION OF GARFIELD
JULY 2ND 1881

1881 Arthur's Administration 1885

WASHINGTON'S STATUE NEW YORK

Bills.
ANTI-POLYGAMY
ANTI-CHINESE
CIVIL SERVICE

OTHER EVENTS

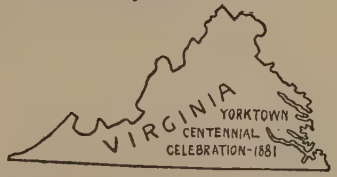
EXECUTION OF GUITEAU
NORTHERN PAC. COMPLETED
POSTAL NOTES INTRODUCED
STANDARD TIME INTRODUCED
RED CROSS SOCIETY
ANTI-MONOPOLY & LABOR PARTIES

Death
OF EMERSON AND LONGFELLOW

WASHINGTON'S MONUMENT

ATLANTA COTTON EXPOSITION ·1881·

ALASKAN TERR. GOV'MT ORG. IN 1884



FIRST
1885
CLEVELAND
TERM
1889
WASH
ADMITTED
1889
MONTANA
ADMITTED
1889
NORTH
DAKOTA
ADMITTED 1889
SOUTH
DAKOTA
ADMITTED 1889
PRESIDENTIAL
SUCCESSION
BILL
SECY OF STATE
AND OTHER
CABINET
OFFICERS
IN THEIR
TURN
OTHER
IMPORTANT
BILLS
INTER-STATE
COMMERCE
ELECTORAL
COUNT
FISHERIES
TENURE OF OFFICE
CIVIL SERVICE
FITZ JOHN PORTER
CHINA
EXCLUSION ACT
1888
NAVY
INCREASED
ANARCHIST
HAYMARKET
1886
RIOT
PLOTS
Deaths
GRANT
McCLELLAN
HENDRICKS
HANCOCK
LOGAN
SEYMOUR
TILDEN
ARTHUR
WHEELER
BEECHER
CONKLING
SHERIDAN
TEXAS
GALVESTON
SWEPT BY FIRE
LOUISIANA
NEW ORLEANS
COTTON EXPOSITION 1885
CHICAGO
HAYMARKET RIOT
ILLINOIS
SOUTH
CAROLINA
CHARLESTON
EARTHQUAKE
1886

HARRISON'S ADMINISTRATION

1889 — 1893

SOME OF THE MORE IMPORTANT EVENTS OF PRESIDENT HARRISON'S ADMINISTRATION.

-1889-

OKLAHOMA OPENED FOR SETTLEMENT.

THE PAN-AMERICAN CONGRESS.

THE JOHNSTOWN FLOOD

FOUR NEW WAR SHIPS BUILT

-1890-

THE FIRST EXECUTION BY ELECTRICITY.

THE 11TH CENSUS POP.-62,622,250-

IDAHO AND WYOMING ADMITTED AS STATES

THE SHERMAN SILVER PURCHASE ACT.

THE MORMONS CEASE TO TEACH AND PRACTICE POLYGAMY.

THE DEATH OF JOHN C. FREMONT

-1891-

CHICAGO AND LELAND STANFORD UNIVERSITIES FOUNDED.

THE BEHRING SEA TREATY.

OPENING OF DREXEL INSTITUTE IN PHILADELPHIA.

THE BLACK HAND IN NEW ORLEANS

TROUBLE WITH THE "MAFIA."

-1892-

THE HOMESTEAD LABOR TROUBLES

THE CHINESE EXCLUSION BILL RE-ENACTED.

THE PANAMA SCANDAL.

THE UNITED STATES AID FAMINE STRICKEN RUSSIA.

THE FARMERS ALLIANCE MOVEMENT.

CLEVELAND'S 2ND ADMINISTRATION

1893

1897

NIAGARA FALLS "HARNESSED" ·1895·

WORLD'S COLUMBIAN EXPOSITION OPENED 1893

FOREST FIRES IN WISCONSIN 1894

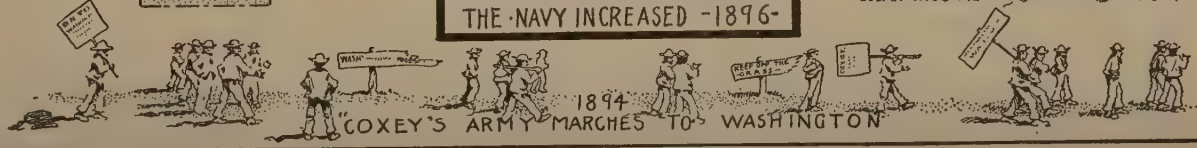
EVENTS

BEHRING SEA CONTROVERSY 1893-
FINANCIAL PANIC-1893-
CHINESE TREATY-1894-
RAILWAY STRIKE IN CHICAGO-1894-
TROUBLE WITH VENEZUELA & ENGLAND-1895-
THE NAVY INCREASED -1896-

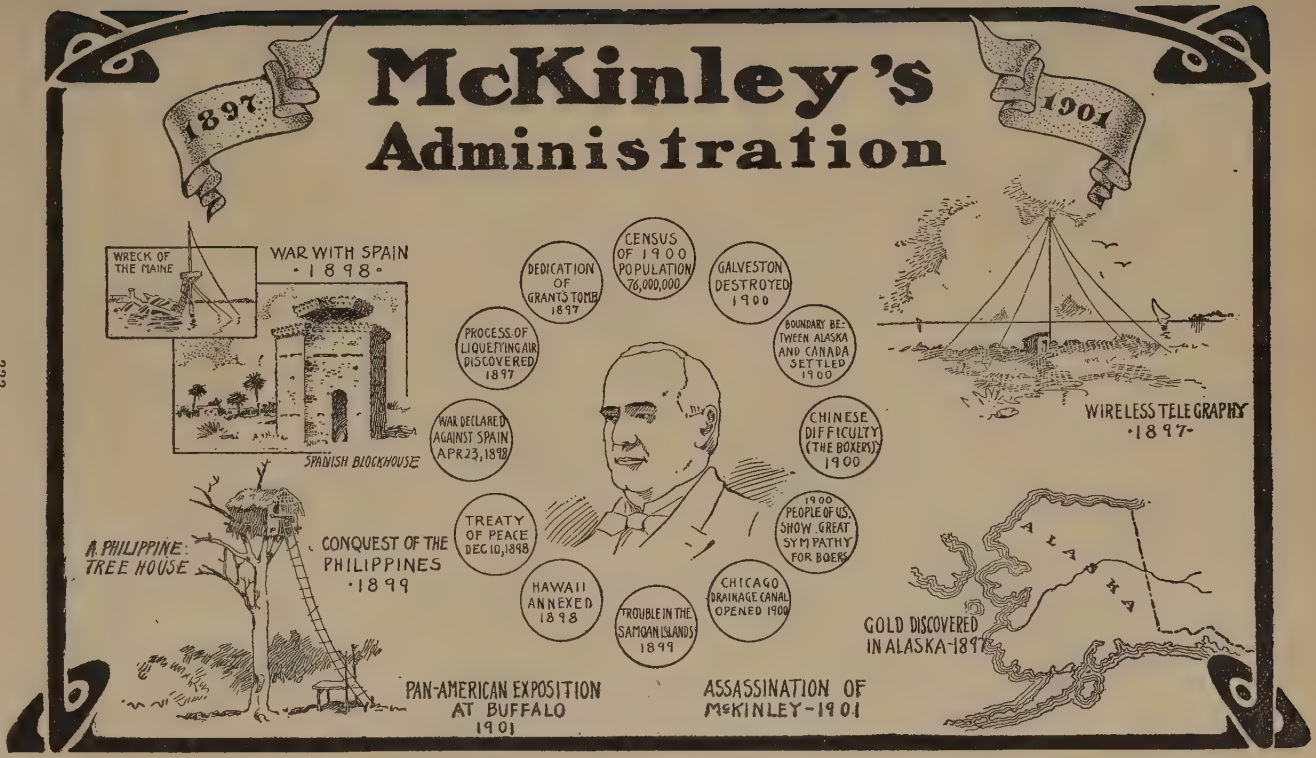
UTAH TO THE 18 ADMITTED UNION IN 95

CUBAN INSURGENTS

OUTBREAK OF THE CUBAN REBELLION -1895-

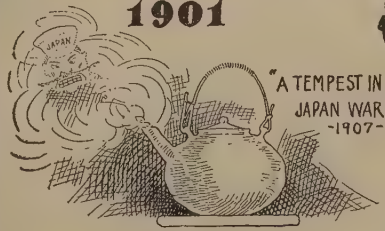


1894 "COXEY'S ARMY" MARCHES TO WASHINGTON

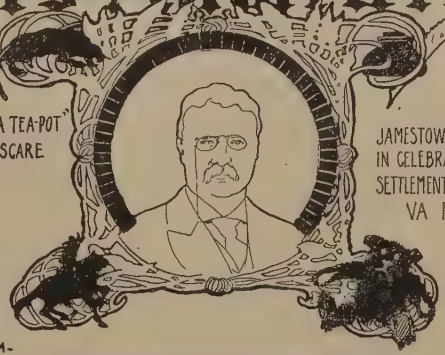

McKinley's Administration
1897
1901
WAR WITH SPAIN
·1898·
WRECK OF THE MAINE
SPANISH BLOCKHOUSE
DEDICATION OF GRANT'S TOMB 1897
CENSUS OF 1900 POPULATION 76,000,000
GALVESTON DESTROYED 1900
PROCESS OF LIQUEFYING AIR DISCOVERED 1897
BOUNDARY BETWEEN ALASKA AND CANADA SETTLED 1900
WAR DECLARED AGAINST SPAIN APR 23, 1898
CHINESE DIFFICULTY (THE BOXERS) 1900
TREATY OF PEACE DEC 10, 1898
1900 PEOPLE OF U.S. SHOW GREAT SYMPATHY FOR BOERS
HAWAII ANNEXED 1898
TROUBLE IN THE SAMOAN ISLANDS 1899
CHICAGO DRAINAGE CANAL OPENED 1900
WIRELESS TELEGRAPHY ·1897·
A PHILIPPINE TREE HOUSE
CONQUEST OF THE PHILIPPINES ·1899
ALASKA
GOLD DISCOVERED IN ALASKA-1897
PAN-AMERICAN EXPOSITION AT BUFFALO 1901
ASSASSINATION OF McKINLEY-1901

Roosevelt's Administration

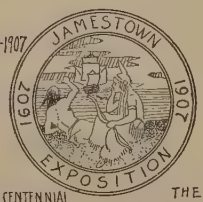
1901 — 1909



"A TEMPEST IN A TEA-POT"
JAPAN WAR SCARE
-1907-



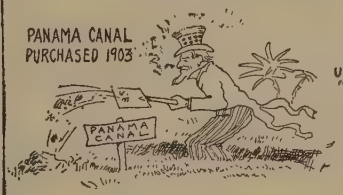
JAMESTOWN EXPOSITION-1907
IN CELEBRATION OF THE
SETTLEMENT OF JAMESTOWN
VA IN 1607



THE
LEWIS AND CLARK CENTENNIAL
EXPOSITION AND ORIENTAL FAIR
1905

THE
LOUISIANA PURCHASE
EXPOSITION - 1904-

PANAMA CANAL
PURCHASED 1903

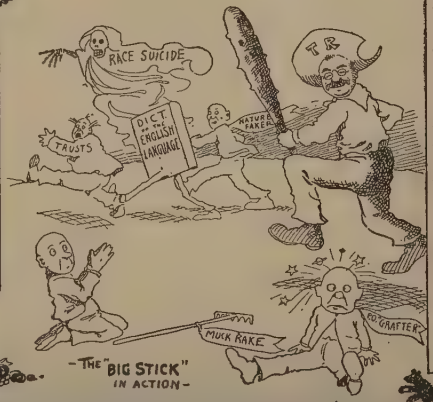


UNCLE SAM-
"I'LL JUST
DIG THIS
THING MY-
SELF."

Other Events.

ANTHRACITE COAL STRIKE '02 - IROQUOIS THEATER FIRE '03
BALTIMORE FIRE 1904 - END OF PHIL. WAR '02
CLEVELAND DIED 1908 - PACIFIC CABLE LAID
RICHARD MANSFIELD DIED '07 - WIRE STRIKE '07
NAVY INCREASED - DEATH OF JOS. JEFFERSON

SAN FRANCISCO EARTHQUAKE APR. 1906.



-THE "BIG STICK" IN ACTION-

Rulers of the World

Country	Ruler	Birth	Accession	Title
Abyssinia	Menelek II.	1843	1889	King of Kings
Afghanistan	Habibullah Khan		1901	Ameer
Argentine Republic	Dr. Jose F. Alcorta		1906	President
Austria-Hungary	Francis Joseph II.	1830	1848	Emperor
Belgium	Leopold II.	1835	1865	King
Bolivia	Senor Y. Montes		1904	President
Brazil	Senor Alfonso Penna		1906	President
British Empire	Edward VII.	1841	1901	King
Chile	Senor Pedro Montt		1906	President
China	Pi Yu			Emperor
Colombia	Gen. R. M. Reyes		1905	President
Costa Rica	Cleto Gonzales Viquez		1906	President
Denmark	Frederick VIII.	1843	1906	King
Ecuador	Gen. Aloy Alfaro		1906	President
France	M. Armand Fallieres	1841	1906	President
German Empire	William II.	1859	1888	Emperor
Greece	George I.	1845	1863	King
Guatemala	Manuel E. Cabrera	1856	1898	President
Haiti	Gen. Simon		1908	President
Honduras	Manuel Bonilla	1849	1903	President
Italy	Victor Emmanuel III	1869	1900	King
Japan	Mutsuhito	1852	1867	Mikado
Korea	Yi Syek		1907	Emperor
Liberia	Arthur Barclay		1907	President
Luxembourg	Adolf		1890	Grand Duke
Mexico	Gen. Porfirio Diaz	1830	1876	President
Monaco	Albert	1848	1889	Prince
Montenegro	Nicholas I.	1841	1860	Prince
Morocco	Mulai-Abd-el-Aziz	1878	1894	Sultan
Nepal	Dhiraj Shamsher Jang	1875	1881	Maharaja
Netherlands	Wilhelmina	1880	1890	Queen
Nicaragua	Gen. Jose Zelaya		1898	President
Norway	Haakon VII.	1872	1905	King
Oman	Seyid Turki		1888	Sultan
Paraguay	Gen. Benigno Ferraya		1906	President
Persia	Mohammed Ali Mirza	1872	1907	Shah
Peru	Jose Pardo		1904	President
Portugal	Manuel II.	1889	1908	King
Roumania	Coral I.	1839	1881	King
Russia	Nicholas II.	1868	1894	Czar
Salvador	Gen. Figueroa		1907	President
Santo Domingo	Gen. Tamon Ceres		1906	President
Servia	Peter I.	1844	1903	King
Swaziland	Ngwane		1889	Paramount Chief
Spain	Alfonso XIII.	1886	1902	King
Sweden	Gustav V.	1858	1907	King
Switzerland	Eduard Muller		1908	President
Turkey	Mehmed V.		1909	Sultan
United States	Wm. H. Taft	1857	1909	President
Venezuela	Gen. Gomez		1908	President

"Books are masters who instruct us without rods and ferules, without hard words and anger, without clothes or money."

—*Richard de Bury.*

Language and Grammar

INTRODUCTION.

Language study is one of the most essential subjects for the consideration of the pupil, and there is no book published so well adapted to assist the pupil in this study as THE NEW PRACTICAL REFERENCE LIBRARY. The fact that these subjects have all been treated by educators lends that superb dictum in the choice of language, and the fact that the entire work has been edited to meet the requirements of the schools in this one particular makes it stand essentially alone as a help of this kind. No other one subject lends that culture that the correct use of English does, and the necessity for the accomplishment of this end is a careful training in language work.

We supply you herewith a graded outline of work for the pupil, and careful study of the great amount of supplementary material supplied by THE NEW PRACTICAL REFERENCE LIBRARY will enable any student to become proficient.

Following this work on language we give you an outline of the entire subject of grammar, which enables the student to study the subject systematically. This outline is adapted to the use of any text book which may be used in the schools, and its use will prove beneficial to the student.

FIRST YEAR.

The correct forms of written and oral language work should be introduced and taught in all branches of school work and in the primary grades especially incorporated with the reading lessons.

A thorough understanding of and familiarity with the proper forms of speech used in conversation are the most important factors in the child's knowledge and use of language and for that reason pupils should be encouraged to talk. Subjects and objects of common interest may be introduced and the skillful teacher can, in these lessons, materially assist the child in briefly and clearly expressing himself and adding to his vocabulary by natural and gradual growth.

By describing objects, places they have been and things they have seen, the pupils' imagination and observation are stimulated and children will invariably respond to topics of this kind.

Try, as far as possible, to teach the pupils to have some system, in giving such description, as to when they saw the object, where they saw it, how it looked and what they (the pupils) did. By forming this habit a connected and comprehensive story can be told by the pupil without needless repetition and unnecessary words.

CONVERSATIONAL EXERCISES.

A conversational exercise in the form of a game may be effectively introduced, the teacher noting and correcting all faulty construction. One pupil may think of some object or thing and the pupils and teacher, by asking questions, try to guess the object in question. All questions and answers should be in complete sentences.

The interweaving of stories and games is a helpful, as well as attractive feature of this work and the following practical suggestions will prove of great assistance to the teacher in this important branch of her work:

Read or tell the class simple but interesting stories, told in words of the pupils' vocabulary, and after they have become familiar with the story allow one to commence it, another taking it up where the first one stops, and continuing until several pupils have taken part in the exercise.

Another attractive form of language work is to let certain pupils take the parts of the different characters in the story and in original sentences tell their part of the story. Such portions of the story as the child may not remember can be supplied by the teacher. In conducting these lessons any incorrect forms or sentences should be immediately corrected but in such a way that the pupil will not feel self-conscious.

MEMORY WORK.

The memorizing of simple poems comes under the head of language work and can be made interesting as well as instructive by the use of illustrations. Words or sentences which can be definitely associated with pictures or objects are much easier to remember and retain than miscellaneous words written upon the blackboard. Simple poems with which the class is familiar may be illustrated on the board by the pupils, each child being given one line to illustrate.

SENTENCE BUILDING.

Instructive lessons may be planned by drawing upon the board a picture of some animal, bird or race of people and short, simple sentences, explaining about the life and characteristics of the subject written in connection with it. For instance, if the subject is the Eskimo, a picture of an Eskimo child may be put upon the board with a hut or sled in the background and sentences such as "I live in the far North. My home is in a hut. I wear a fur coat. I eat fat food." Many other subjects can be treated in a similar manner. After the pupils become familiar with several, call some child to the board and let him write or say such sentences as "I wear warm clothes. I ride on a sled. A dog pulls me. I live in a hut," etc., the other pupils guessing the subject described.

SECOND YEAR.

As second grade language work is but a continuation of the first grade work, we mention only a few suggestions in addition to those already given for the first year.

Nature study should be brought into the language work and lessons on the various flowers, brought to school by the pupils, can be profitably introduced, describing and showing the various parts of the flower and their uses. When familiar with the form, pictures can be made by the child with pencil or colored crayon.

See how many sentences can be made describing the sweet pea, the pansy, the violet.

Pupils should now learn the use of singular and plural forms of verbs; the use of descriptive adjectives, of capitals, periods and interrogation marks. For this purpose sentences may be written on the board leaving blanks to be properly filled in by the child.

After reading a paragraph in their readers, have the pupils pick out words having "a" before them, also those having "an," and explain the difference. Put exercises on the board with the two articles left blank, to be filled in by the pupils.

Thanksgiving, Christmas, Decoration Day, and other holidays prove interesting topics for conversational lessons, and should be frequently introduced.

Pictures hung about the walls of a school room will appeal to the child's imagination, and interesting lessons can be made by calling on different pupils to describe and name objects found in the picture.

As an illustration of the way in which composition work can be built up by the teacher in this grade, at her suggestion, papers are handed in on which are written five or six sentences describing the appearance of an orange, or any other subject which has been under discussion. Careful attention is given to the arrangement, form and spelling of the words, and these papers with corrections are handed back for rewriting. This set of papers should be kept until the taste, uses, formation, etc., of the orange are discussed by the teacher and class and similar sentences written on each subject. These sentences, when corrected, can be condensed and incorporated in the form of composition. The article and full page illustration on the orange, given in the NEW PRACTICAL REFERENCE LIBRARY, will be an invaluable aid in the preparation of this exercise.

THIRD YEAR.

Besides the oral and written exercises, composition work is taken up in this grade. This work should be based on the subjects discussed in oral lessons. Do not assign to beginners subjects which they do not understand. To write intelligently they must have a thorough understanding of the subject, gathered from observation, oral instruction and from reading.

The teacher may write on the board the outline of a story and the children fill it out in the form of written exercises.

A valuable exercise, in outlining subjects, is to have the pupils give the suggestions and the teacher arrange them in their proper order, after all have been given.

In taking up new subjects for study, it is not enough to give promiscuous information in a general way, but each topic should be arranged in a systematic and concise manner. For this purpose we give the following suggestive outline developed from the article in the NEW PRACTICAL REFERENCE LIBRARY to be used in connection with a lesson on Snow.

SNOW.

FORMATION.
- Frozen moisture.
- Crystallized moisture.
- Frozen vapor.

FLAKES.
- Six-pointed stars.
- Composed of crystals.
- Kinds.
  - Thin plates.
  - Prismatic with six sides.
  - Pyramids with six sides.
  - Spherical with needle shaped crystals.
  - Prismatic with thin plates at the ends.

SIZE.
- From one inch to 7/100 inch in diameter.
- Depending on temperature and moisture in atmosphere.
- Flakes larger when weather is mild.

USES.
Non-conductor of heat.
Protects plants and seeds.
Supplies water for springs and rivers.
Fertilizes the ground.
SNOWFALL.
Heaviest in mountains.
Alps.
Rocky Mountains.
SNOWLINE.
Lower in cool climate than in warm.
Varying according to altitude and latitude.
GLACIERS.
Great masses of frozen snow.
Found in high altitudes and latitudes.

With such lessons for a basis, pupils, in composition work, will be able to group facts about the main topic in their logical sequence, and in doing so will learn the principles of paragraphing.

For drills on sentence making the teacher can give a sentence such as "The bird is singing," or "We heard its merry music," and let the class write as many sentences as they can think of which will convey the same meaning.

FOURTH YEAR.

As the pupils in this grade should be well advanced in sentence construction and possess a fair knowledge of the use of capitals, common abbreviations and punctuation, written exercises in the form of letters written to some friend, describing some place they have been or thing they have done, can be introduced, teaching the correct letter forms, how to fold letters and to address an envelope. These letters can be written to one another, one pupil being the postman and collecting and distributing the letters as directed. Each pupil in turn reads the letter he has received, omitting the name, and criticisms on the construction and proper language forms be made either by the teacher or by the class. The letter in question is corrected and at the end of the recitation all letters are handed to the teacher. By omitting the name of the pupil criticisms can be made freely without causing any child embarrassment.

Famous pictures should be introduced and hung about the room. Have pupils find out all they can about them and the artists who painted them. Call attention to the strong points in the picture; the objects which stand out in the picture.

A story should be read by the teacher, and when pupils are familiar with it, a test of the child's understanding of the story can be made by following the outline given below in reviewing it:

Author.
Name.
Home.
Life.
Principal characters.
Appearance.
Life.
Home.
Character.
Place in story.
Other characters.
What they did.
Appearance.
Part in story.
Incidents.
Principal happenings.
Causes.
Where they take place.

As the pupil advances in the grammar grades such outlines, made more exhaustive, will be an invaluable aid to the pupil in composition work.

"Our Home."

We present here the very interesting series of essays entitled "Our Home." Someone has fittingly called this combination, "Mother, Pupil, Teacher," the second trinity. We have here the result of actual work done by a class of boys and girls, and a comparison of these essays with the subjects as treated in The New Practical Reference Library will show the assistance this publication gives in the preparation of such work.

The first essay shows the different kinds of homes and gives one an idea of the development from the habitation of the original cave dwellers, the wigwam of the Indian and the ice hut of the Eskimo to the modern home of intelligent people.

The next essay begins with the foundation of the home, showing what enters into its construction. This is followed by an essay on lumber, which goes into the framework, and then an essay on iron, which helps to hold this framework together. It is interesting to note that the house is plastered before the glass is put in; the painting and varnishing follow in regular order, and after that the decorating. As a diversion we call attention to some of the things which the world contributes to the furnishings of our homes. Two pages are devoted to "Modern Inventions in the Home" and a very interesting lesson, as a climax, on "How the Home Teaches Patriotism."

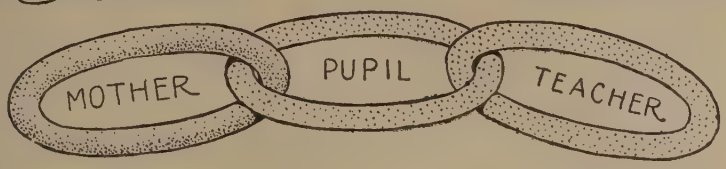
It is also interesting to note that under the subject of Drawing in The New Practical Reference Library, we supply you with a colored plate showing various cover designs suitable for booklets of this kind, and a very attractive design for "Our Home" is suggested.

Educators have been enthusiastic in their endorsement of this series of essays; and hundreds of suggestions of this kind offered in the Educator, together with the abundance of supplementary material in The New Practical Reference Library, will enable anyone to develop similar subjects in a like manner.

These lessons are based on the inductive method of teaching. They represent the supplementary work which arises from the use of this method and which is required of all pupils in all schools. The inductive method relates to known subjects and familiar objects.

In assigning these lessons, for example, the teacher will say that tomorrow we will discuss all the materials that enter into the building of a home, and she will assign to one pupil the subject of brick, to another lumber, and similar subjects to the other pupils. You can imagine the intense interest created, for a casual reading of the essays will impress one with the carefully prepared information which has been embodied in them.

The pen sketch illustrations are not merely attractive, but are aids in creating and developing habits of observation. The writing of the essays will call for the exercise of the pupil's faculties of observation, and the different kinds of brick, for instance, found in houses, chimneys and walks, will become to him objects of interesting study. Observation makes him an investigator. Investigation makes him a thinker. The thinker is the man who does things. It was the thinker who gave us the steam engine, who invented the telephone and telegraph. Methods and studies such as these teach self-reliance and resourcefulness, and awaken habits of systematic investigation, close observation, self help and clear thought—traits indispensable to the complete development of useful, capable men and women.



OUR HOME

A SERIES OF ILLUSTRATED

ESSAYS

BY THE PUPILS

OF THE

AUSTIN SCHOOL

1908

DEDICATED

TO OUR TEACHER

KINDS OF HOMES

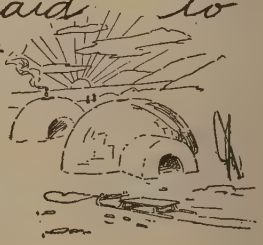
-BY LLOYD MILLSOME-

In the earliest times the cave was the first home of man.

Traces of such are found in so many countries that it is often thought that all people at one time in their history dwelt in caves.

A wigwam is a North American indian cabin or hut, generally of a conical shape, formed of bark or mats, laid over saplings planted in the ground and converging at the top, where there is an opening for the escape of smoke.

In summer the Eskimos live in tents covered with skins; in winter they may be said to burrow beneath the snow. In Greenland houses built of stone and cemented with turf



are used as permanent habitations.

The Filipino's house is constructed of bamboo; the floors are built about five feet from the ground, and the roofs are covered with nipa or some other form of thatch.

A bungalow is a kind of house occupied by the European in India. Those elegantly and finely furnished and invariably surrounded by a veranda.

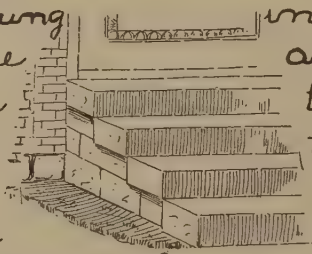
The log cabin is a common habitation in a new country.

A house is the modern home of intelligent people. The common house is usually made of wood, brick or stone and varies in price from a few hundred to millions of dollars.

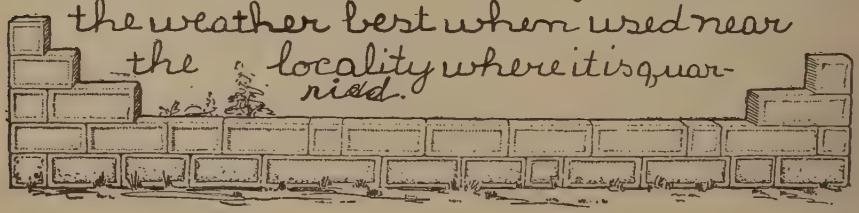
STONE

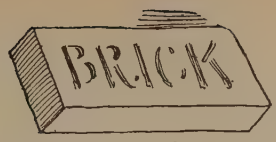
~BY CHARLIE SMITH~

Stones are of extensive use for a great variety of purposes, such as building, paving, grinding and ornamental purposes. Granite, slate, limestone, marble and sandstones are the building stones in most common use in the United States. There are numerous other stones however suitable for finishing interiors such as serpentine and onyx.



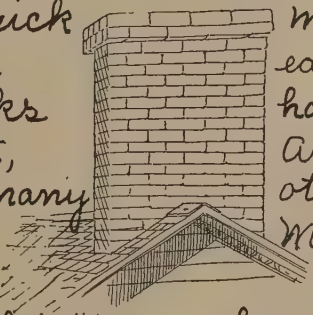
Granite is the strongest and slate the most durable of building stones. Soft sandstones absorb a great deal of water and are not durable for exteriors. Stones containing iron or other substance which the water dissolves frequently becomes discolored. Stone generally withstands the weather best when used near the locality where it is quarried.





By HARRY SCOTT.

Brick is a sort of artificial stone made by molding a mixture of clay and sand and drying it in the sun or baking or burning in a kiln. The ordinary brick used in building and paving is eight inches long, four inches wide, and two inches thick.



The art of brick making dates from very early times. Sun dried bricks have been found in Egypt, Assyria, Babylonia and many other ancient countries. Many of these bricks contain inscriptions which are of great historic value, since they constitute the only known record of the people and events of the time in which they were made.

Bricks are extensively used in the foundations and walls of buildings. They are also used for sewers, cisterns, and numerous other purposes.

BY MILLIE DEBALL

Lumber is timber manufactured for building purposes. Its manufacture constitutes one of the most important as well as one of the most extensive industries of the world.

The forests in the United States are being rapidly destroyed and unless something is done to preserve them in a very short time there will be no lumber left in our country. In most foreign countries as soon as a tree is cut down it is replaced by another.

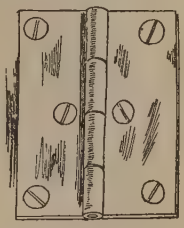
There are many and various uses of lumber. The greater per cent of lumber is used for building purposes, but there is a great deal made into furniture.

The most common kinds of lumber in this country are maple, pine, oak, elm, poplar, walnut, butternut and ash.

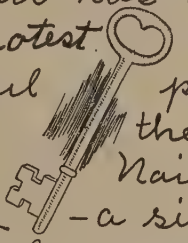
IRON

BY GEORGE CAMPBELL

Iron ore is very liberally distributed over the earth and with the exception of Australia every continent has a good supply. The United States is the largest producer of iron ore.



It is the most useful of all metals and has been known from the remotest times. One of the most useful products of iron entering into the making of a home is nails. Nails are made automatically - a single machine making five hundred nails per minute. Their manufacture forms a very interesting study.

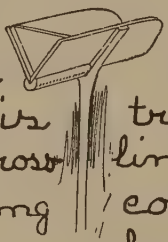


Brackets supporting balconies, windows or upper portions of a building are generally made of iron and sometimes elaborately designed and ornamented. Many other items of use and ornament are supplied our homes by this most useful metal.

PLASTER

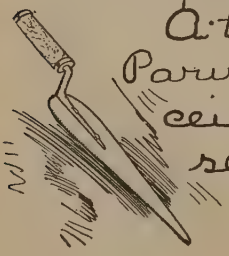
BY MAY GRANT.

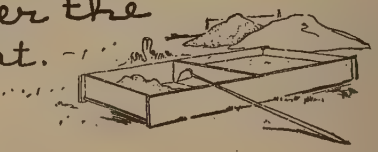
Plastering is the art of covering the surface of masonry or woodwork with mortar, cement, staff, or stucco in order to give it a smooth and uniform surface. For the purpose of receiving the plaster the wall is generally covered with laths, or thin strips of wood or steel with narrow spaces between them.

The face of the first coat which should be of considerable thickness is  trowelled or indented with cross lines to form a key for the finishing coats. The second coat is applied when the first is thoroughly dried.

The setting coat which is of pure lime or, for fine work, of plaster of Paris or stucco, is applied to the second coat before it is quite dry.

A thin coating of plaster of Paris is frequently applied to ceilings after the setting coat.





GLASS

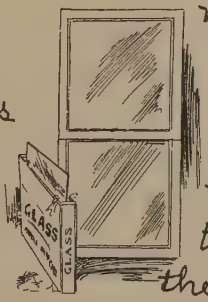
By GLADYS HAYES

Glass, a hard brittle substance, is made by melting by intense heat certain ingredients.

Unless colored by some foreign substance it is usually transparent.

There are many different kinds of glass, some varieties are flint, crown, window, bottle, and plate.

The principal methods of manufacture are those used for window glass, bottle glass, and plate glass.



For window glass the material is blown into the form of a cylinder, it is then slit, flattened, and cut into the desired sizes.

For bottle glass the sticky, melted glass is taken on the end of a tube and put into a mould where it is blown into shape.

For plate glass the melted compound is poured out on a large iron table, rolled to the desired thickness, cooled and afterwards polished.

PAINT

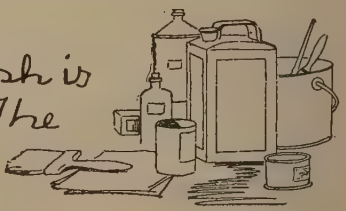
By Irma Jones

Paint is a compound of coloring substances mixed with oil glue or water. The coloring substance is called a pigment and the liquid with which it is mixed a vehicle. The greater number of pigments are mineral but some like cochineal are animal substances and others, like indigo, are of vegetable origin.

For ordinary house paint especially for external uses, white lead and boiled linseed oil are generally used.

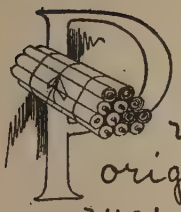
Varnish is a liquid made by dissolving a resin in alcohol, turpentine or other oil. It is used to form a thin, transparent coat over surfaces, to protect them from heat, air and moisture and to make them more beautiful

The base of varnish is Copal, or fossil gum. The best gum is found in Zanzibar.



Wall Paper.

BY JOHN HUDSON

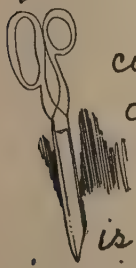


Paper used for decorating the walls and ceilings of rooms originated among the Chinese and was not introduced into Europe until the eighteenth century.

The papers at first were imitations of the leather tapestry and velvet hangings which had long been common as wall decorations but gradually the designs became original and varied.

Most of the processes are by machinery similar to that used in calico printing, but there is also much hand work done in the finer qualities.

The paper is prepared in strips which are made fast to the wall by paste.



The skill of the workman consists in matching the strips and laying the paper so as to avoid wrinkles.

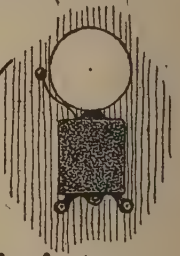
The manufacture of wall paper is a great industry and paper hanging is an important occupation.

MODERN INVENTIONS IN THE HOME

BY CLAUDE MILLS AUSTIN HIGH SCHOOL.

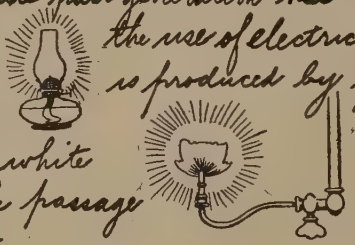
Old Fashioned Knockers and Modern Door-Bells

In the change from the old-fashioned knocker to the modern door-bell we have an instance of the progress of the past century. Boys and girls now understand electricity sufficiently to install such service in the home.



Lighting

The great improvement in lighting during the past generation has also culminated in the use of electricity. The incandescent electric light is produced by passing a current over a small conductor which is raised to a white heat because of the current of its resistance to the passage and thus gives light.

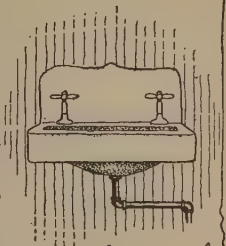


Heating

The open fireplace is an excellent method of heating, though the waste is considerable. Heating and ventilation are receiving more and more attention as sanitary science is understood. Hot air, steams, hot water and electricity are each used in modern heating.

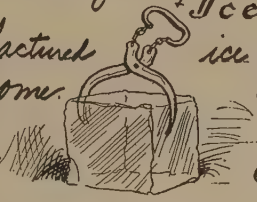
Water

Water, like air, is absolutely necessary to life. An ample and pure supply is one of the first requirements in any adequate system of sanitation.



Ice

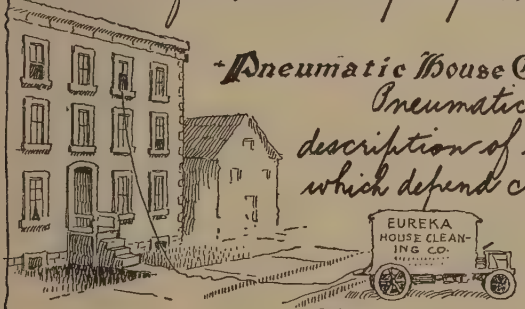
Manufactured ice adds to the comfort of the modern home. It is usually made from distilled water. A plant once established is run at comparatively little expense



The Telephone

One of the greatest of modern conveniences is the telephone. The instruments have been brought to a high degree of perfection for home use as well as for business purposes.

Pneumatic House Cleaning



Pneumatics comprehends the description of those machines which depend chiefly for their action upon the pressure and elasticity of air.

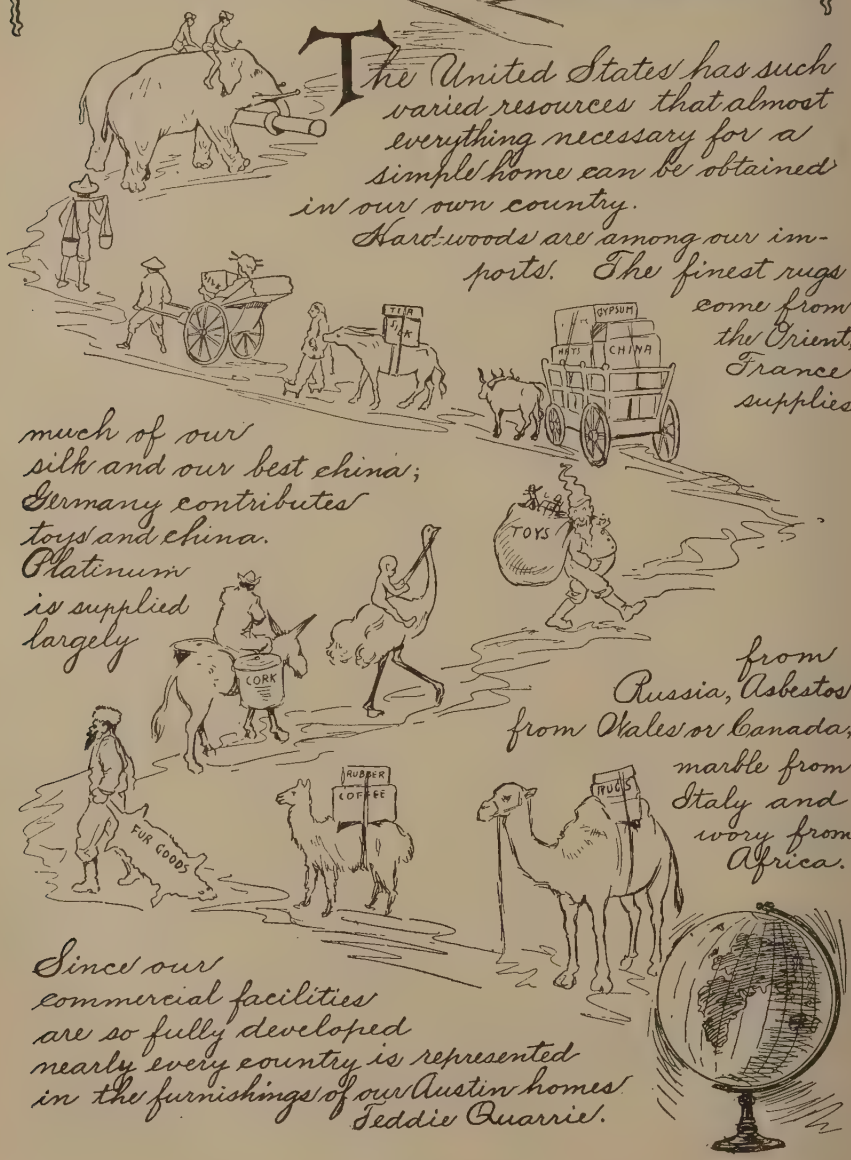
The Automobile

The period of modern development of the automobile began in 1894 when a Frenchman applied his instantaneous generator to a motor vehicle It is coming into very general use.

WHAT THE WORLD CONTRIBUTES TO A HOME IN AUSTIN

The United States has such varied resources that almost everything necessary for a simple home can be obtained in our own country.

Hard-woods are among our imports. The finest rugs come from the Orient, France supplies much of our silk and our best china; Germany contributes toys and china. Platinum is supplied largely from Russia, Asbestos from Wales or Canada, marble from Italy and ivory from Africa.



Since our commercial facilities are so fully developed nearly every country is represented in the furnishings of our Austin homes.

Teddie Quarrie.

HOW THE HOME TEACHES PATRIOTISM

By Alice Fawley

Such is the patriot's boast, where'er we roam,
His first, best country ever is at home.
— Goldsmith

'Mid pleasures and palaces though we may roam,
Be it ever so humble there's no place like home.
— Payne.

Nor need we power or splendor,
Wide hall or lordly dome;
The good, the true, the tender,—
These form the wealth of home.
— Hale.

Each man's chimney is his golden Milestone,—is the central point from which he measures every distance through the gateways of the world around him.
— Longfellow.

Breathes there a man with soul so dead,
Who never to himself hath said,
"This is my own, my native land"?
Whose heart hath ne'er within him burned,
As home his footsteps he hath turned
From wandering on a foreign strand?
— Scott.

Outlines for Grammar Work

In the following outlines we have endeavored to present in a concise and systematic way the various parts of speech studied in the grammar grades and their relation to the phrase, clause, sentence, etc. Having pupils develop such outlines and study the subject from them will assist them in securing a thorough knowledge of the different parts of speech, and will be of far greater assistance in helping them to remember the subjects learned than any other method.

- SENTENCE.
  - Classes.
    - Declarative.
    - Interrogative.
    - Imperative.
    - Exclamatory.
  - Parts.
    - Subject.
    - Predicate.
    - Copula.
  - Kinds.
    - Simple.
    - Complex.
    - Compound.
  - Arrangement.
    - Regular.
    - Irregular.

- PHRASES.
  - Uses.
    - Adjective.
    - Adverbial.
    - Substantive.
    - Independent.
  - Classes.
    - Prepositional.
    - Infinitive.
    - Participial.
    - Independent.
  - Forms.
    - Simple.
    - Compound.
    - Complex.
    - Principal.
    - Auxiliary.
    - Transitive.
    - Intransitive.
  - How determined.
    - Use.
    - Form.
    - Structure.

- NOUN.
  - Classes.
    - Proper.
    - Common.
      - Abstract.
      - Verbal.
      - Collective.
  - Properties.
    - Person.
      - First.
      - Second.
      - Third.
    - Number.
      - Singular.
      - Plural.
    - Gender.
      - Masculine.
      - Feminine.
      - Common.
      - Neuter.
    - Case.
      - Nominative.
      - Possessive.
      - Objective.

- PRONOUN.
  - Classes.
    - Personal.
      - Simple.
      - Compound.
    - Relative.
      - Simple.
      - Compound.
    - Interrogative.
      - Direct.
      - Indirect.
  - Forms.
    - Nominative.
    - Objective.
  - Properties.
    - Person.
    - Number.
    - Gender.
    - Case.

VERB.

- Classes.
  - Regular.
  - Irregular.
  - Auxiliary.
  - Defective.
- Use.
  - Transitive.
  - Intransitive.
- Properties.
  - Voice.
  - Mode.
  - Person.
  - Tense.
- Principal parts.
  - Present.
  - Past.
  - Past Participles.
- Forms.
  - Infinitives.
  - Participles.
- Conjugation.

ADVERB.

- Forms.
  - Simple.
  - Compound.
- Classes.
  - Manner.
  - Degree.
  - Cause.
  - Time.
  - Place.
  - Interrogation.
  - Conjunctive.
- Comparison.
  - Positive.
  - Comparative.
  - Superlative.

- ADJECTIVE.
  - Forms.
    - Simple.
    - Derivative.
    - Compound.
  - Use.
    - Predicate.
    - Modifying.
  - Classes.
    - Descriptive.
    - Limiting.
    - Articles.
      - Definite.
      - Indefinite.
    - Pronomials.
      - Demonstrative.
      - Interrogative.
      - Indefinite.
      - Relational.
  - Comparison.
    - Degree.
      - Positive.
      - Comparative.
      - Superlative.
    - Method.
      - Inflection.
      - Composition.
      - Irregularly.

- PREPOSITION.
  - Forms.
    - Simple
    - Compound.
  - Use.
    - Expresses relation.
    - Introduces phrases.

- CONJUNCTION.
  - Form.
    - Simple.
    - Correlative.
    - Phrasal.
  - Classes.
    - Coördinate.
      - Copulative.
      - Alternative.
      - Adversative.
    - Subordinate.
  - Use.
    - Connects words.
    - " phrases.
    - " clauses.

Law and Politics and Business

All men should know as much of the ordinary law as protects their common and universal rights, a general understanding of how to make agreements, conduct sales, draw notes, and such principles of business law will prevent, every day, important mistakes leading to loss. Our course gives one a valuable foundation for the understanding of these questions, and ought to be mastered by every teacher and every student of sufficient age to understand business transactions. It deserves, indeed, a place in every household.

Law

I. CLASSIFICATION.
- First Classification:
  1. International law.
  2. Constitutional law.
  3. Administrative law.
  4. Special classes.
     a. Roman.
     b. Civil.
     c. Salic.
     d. Commercial.
     e. Parlimentary.
- Second Classification:
  1. Common law.
  2. Equity.
  3. Statute.

II. ADMINISTRATION.
1. Procedure.
2. Offenses and punishments.

III. LAWS CONCERNING SPECIAL RELATIONS.
1. Husband and wife—Marriage; Divorce.
2. Parent and child.
3. Master and servant.
4. Landlord and tenant.

IV. MISCELLANEOUS LEGAL TERMS AND USAGES.

The general article LAW contains the two classifications shown in the outline, with a statement or definition of each. Besides this, there is a long article on INTERNATIONAL LAW, with reference to other important departments, such as WAR; NEUTRALITY; TREATY; DIPLOMACY; MONROE DOCTRINE; PEACE CONFERENCE; INTERNATIONAL, etc. There are also articles on each of the special classes shown in the outline, and comprehensive articles on COMMON LAW; EQUITY and STATUTE, showing the evolution of each.

Besides a long article on PROCEDURE, which shows the exact order and significance of the steps in bringing a case to trial, there is an article on COURTS, including classification; one on JURY; and TRIAL BY JURY, and many others upon minor topics, such as APPEAL; WRIT; EVIDENCE; BAIL; WITNESS; WARRANT, etc. Most of these are referred to in the longer articles so that they are easily found.

Besides an extensive article on CRIME, there are briefer articles on all of the

important ones, from MURDER to BLACKMAIL, ARSON and ASSAULT AND BATTERY, in each of which the distinguishing features are shown as clearly as possible, and the usual punishments. Frequent references are made to separate articles on punishments, crimes and remedies for other offenses, including CAPITAL PUNISHMENT, DAMAGES, PRISON, FINE, etc. The special relations noted in the outline are covered by long articles, the fourth, or the relation of landlord and tenant, being placed under the titles TENANT and LEASE. The others have the titles given.

The division called in the outline MISCELLANEOUS LEGAL TERMS AND USAGES includes a great variety of titles frequently referred to in the other articles mentioned, but also of interest and value in themselves. Among the titles are ESTATE; REAL PROPERTY; PERSONAL PROPERTY; BANKRUPTCY; ATTAINDER; COPYRIGHT; PATENT; WILL; DESCENT; PENSIONS; HOMESTEAD LAWS, and others.

Government

I. FORMS.
II. BRANCHES AND DEPARTMENTS.
III. OFFICES AND TITLES.
IV. ACTIVITIES, PROBLEMS AND RELATED TOPICS.

In the article GOVERNMENT, the classification of government is given. The most important kinds are given separate articles also, and the variations in the governments of different countries are given in the articles upon those countries.

Articles are devoted to the three branches of government—executive, legislative and judicial, and special articles to subdivisions of the former. Referred to from Government, governmental theories are discussed under the article State. Many offices and titles used in speaking of government are described in separate articles, and all of the most important ones are so given. In the last division of this branch of the subject, such questions as CIVIL SERVICE AND CIVIL SERVICE REFORM; COLONIES AND COLONIZATION; THE CONSTITUTION OF THE UNITED STATES; DEAD LETTER OFFICE; NATIONAL DEBT; DIVINE RIGHT OF KINGS; LANDS, PUBLIC; MUNICIPAL GOVERNMENT, are included.

Commerce

I. FORMS.
II. INSTITUTIONS.
III. USAGES.

Under the subject COMMERCE the important terms and institutions are described in separate articles, besides being generally outlined in the article COMMERCE. Among the subjects discussed which, from their nature, must be handled independently are INSURANCE; BANKS AND BANKING; CLEARING HOUSE; AGENCY; CARRIER, COMMON; CONTRACTS; CORPORATION; CREDIT; JOINT STOCK COMPANIES; NEGOTIABLE INSTRUMENTS; PARTNERSHIP; SAVINGS BANKS; BOARD OF TRADE; COMMERCE, CHAMBER OF; ADVERTISING; ANNUITY, and many related topics.

What is commerce?

When did it lead to the development of the merchant? At what time did its growth necessitate markets and fairs?

Describe first means of commerce. Mode during Middle Ages. Effect of Crusades on commerce.

When did trade between nations begin to assume its present world-wide importance? To what two causes was this impetus due?

How did advancement in the science of navigation lead to an increase in the world's commerce?

Why did the restriction of commerce between European nations and their colonies prove unprofitable?

What acts restricted the commerce of the American colonies before the Revolutionary War?

To what great event in the history of our country did this lead?

From what year does the commerce of the United States as a nation date?

First decade:

a. Amount of imports.

b. Amount of exports.

When did our commerce begin to develop rapidly?

Which is greater, the internal or foreign commerce of the United States?

Reasons for this:

a.

b.

c.

d.

How does our internal commerce compare with that of other countries?

What period of time has been remarkable for commerce development?

How did the imports and exports of the United States for 1905 compare with those of France? Of Germany? Of Japan?

Through what waters would a cargo of wheat pass in going from Duluth to Constantinople?

Name two products of your own county exported abroad.

Related Subjects (which see).

a. Chamber of Commerce.

b. Department of Commerce and Labor.

When organized.

Duties.

c. Commercial education.

Sociology and Economics

I. Political Economy.
II. Industrial and Social Principles, Institutions and Movements.

The subject of Political Economy is outlined fully in a long article under this title. From this, references are given to important divisions of the subject and to some common terms, such as Capital; Interest; Wages; Rent; Tax; Value; Population; Statistics; Money; Gresham's Law, and others. The second division of the subject is briefly outlined in the article Sociology, from which references are made to a great many related topics, such as Anarchists; Communism; Coöperation; Factory and Factory Legislation; Illiteracy; Immigration; Labor Organizations; Monopoly; George Junior Republic; Social Settlements; Trusts; Woman's Rights; Convict Labor; Socialism, and others. This division of this branch of the subject is exceptionally complete.

Historical Topics

I. Political Parties and Other Organizations.
II. Events Closely Related to Politics or Sociology, Including Great Expositions.

In the last division of this branch of the subject are included brief articles on the origin and principles of the great political parties, especially of America

and England. There is also an extended article on political parties in the United States, showing their relations to each other, from the formation of the government to the present time. This branch also includes events chiefly of political or sociological interest, such as BLUE LAWS; CORN LAWS; DARTMOUTH COLLEGE CASE; DARIEN SCHEME; FEUDAL SYSTEM; HOME RULE; KU-KLUX KLAN; STATES' RIGHTS; TAMMANY SOCIETY, and similar topics.

Banks and Banking

KINDS.
National.
(a) When organized
(b) Minimum capital
(c) Supervision
(d) Number in 1900
(e) Capital in 1900
(f) Deposits in 1900
State and Private.
(a) Capital
(b) Supervision
(c) Number
(d) Deposits
Meaning of.
Check
Draft
Exchange
Deposit

PURPOSES AND FUNCTIONS.
(a)
(b)
(c)
Results.
(a)
(b)
(c)

NOTED BANKS.
Bank of England.
(a) When incorporated
(b) Original capital
(c) Present capital
(d) Present deposit
(e) Present loans
Bank of France.
(a) Established
(b) Security
(c) Government aid

HISTORY.
Banks B. C.
Roman
Venice
Original purpose
First bank in United States.

TEST QUESTIONS ON BANKS AND BANKING.

What is a check? A draft ? An overdraft? A certified check?

Does an endorsed check by the payee constitute a receipt?

What is negotiable paper?

Are National banks prohibited from loaning money on mortgages?

How many persons are necessary to organize a National bank? What is the minimum capital?

Can National banks issue notes for circulation to the full amount of their bonds?

In what particular does the banking system of the United States differ from that of other leading countries?

How many National banks in the United States in 1905? How many State banks? Private banks?

What were the respective total deposits of each at that time?

When was the first bank chartered in the United States?

When was the first National bank organized in the United States?

Where and with what capital?

What are Savings banks? When and where first organized in the United States of America?

What are Trust Companies?

QUESTIONS—LAW AND POLITICS.

Why should all citizens be informed in regard to law? To what extent?

Upon what is law based? How and where did the idea originate?

What is meant by common law? Equity? Statutory law? International law?

The following are classed under what kind of corporations: Park boards, school boards, boards of colleges, hospitals, charitable associations, etc.?

Of what are labor unions the result? What are their objects? What have they accomplished? Along what two distinct lines do they work? What are the evils and benefits? How are they regarded by the world in general today as compared with their standing some years ago?

What is known as pooling? In forming a trust, what are the principal aims?

What effect does competition have on business?

Name some beneficial results of trusts to the public. What evils follow?

Name some trusts that affect the public directly. That affect them indirectly. What are some of the large trusts of the United States?

What is the important feature concerning obligations of corporations? What are the two main classes?

In what did courts have their origin?

Name the courts of the United States in their order and the action taken by each during a trial. Name persons participating in a trial.

In a criminal case who is the plaintiff?

What is international law? Why is it necessary?

What are some of the rights and duties of a nation during peace? During war?

What do we mean by politics? What are the two great political parties in the United States? In England? For what does each stand?

What are the minor political parties? What do they represent? Name the statesmen of the United States who have had a powerful influence over the politics of the nation in their time. What great reforms have been accomplished through them?

What do we mean by the term municipal government? By whom is it administered? What authority and control has it?

What is meant by municipal ownership? Is this a world-wide question at present? Along what lines is it being agitated?

What lines of work are performed by those engaged in civil service? Give some of the rules governing the applicants.

What did Hayes do along the line of civil service reform? With what evil does this largely do away?

In what way is immigration an evil? In what way beneficial? To what extent is it being restricted?

What part is socialism taking in the politics of today? Give evils and benefits of this order.

What is your county seat? What are the names of the officers of your county?—commissioners, auditor, register of deeds, treasurer, superintendent of schools. What are their duties?

What are your township officers? What are their duties?

JURY AND TRIAL BY JURY.

What is the meaning of trial by jury? When and where did it originate?

What is the grand jury? Petit jury? What is a panel? What is an indictment?

What does the jury do in case the accusation is unfounded? How many men compose a jury?

How are jurors chosen? What happens to a juror accused of treason?

How do they consider the evidence? What happens when the jury fails to agree?

Why is a coroner's jury called? What is its duty? Its size?

How many men in a petit jury?

Board of Trade

MEANING.—What is the Board of Trade?

PURPOSES for which it was first organized:

a.

b.

c.

EUROPEAN BOARD OF TRADE:

When and where first organized?

What city was the first in the world to establish a board of trade?

How did it differ from the board of trade of today?

When was the Chamber of Commerce of Paris established?

Where is the oldest chamber of commerce in Great Britain?

What chamber of commerce is the grand center of the commerce of the old world?

With what exchange do American commercial dealers have the most direct connection?

Name three other leading British exchanges.

AMERICAN BOARD OF TRADE:

When and where first established?

Name in the order of their rank the American boards of trade.

When was the Chamber of Commerce of New York established?

Name the principal boards of trade in the west after Chicago?

When was the Chicago Board of Trade organized, and with how many members?

What is meant by trading on "margins?" Explain the process.

Why do most boards of trade have their own clearing houses?

BASIS OF GRADING:

Why is a strict basis of grading and inspection of wheat observed?

Give a complete table of grading wheat.

With regard to what other grains is the same close discrimination made?

What regulations are made to prevent fraudulent practice on the board of trade?

What are the rules of the board regarding property bought and sold on the floor?

When does a board of trade contract mature?

What is the distinction between *long* and *short* transactions?

CORNER.—What is meant by "corner?" How created? For what purpose? Name memorable wheat corners on Chicago Board of Trade.

SIGN LANGUAGE USED BY BROKERS:

Open hand signifies what?

Back of hand signifies what?

One finger raised means how many bushels?

Two fingers raised means how many bushels?

What is a pit? What is a Bear? A Bull? (which see.)

How and when are settlements made for transactions on the board?

CORPORATIONS.

What is a corporation?

Have the individual members the same rights and duties as the corporation?

Is a corporation dissolved by the death or withdrawal of members?

What is the distinguishing feature of corporations as compared with other associations and societies?

From what law has the conception of a corporation been taken?

I. Public Corporations.

1. States.
2. Cities.
3. Counties.
4. Villages.
5. Parks, etc.

II. Private Corporations.

1. Benefit of Members.
   - Social.
   - Artistic.
   - Scientific.
   - Religious.
2. Pecuniary Profit.
   - Railroad companies.
   - Telegraph companies.
   - Telephone companies.
   - Banks.
   - Insurance, etc.
3. Mutual Aid and Relief.
   - Building and loan.
   - Lodges.
   - Coöperative societies, etc.
4. Incorporated Trusts.
   - Colleges.
   - Hospitals.
   - Charitable institutions.

INSURANCE.

How old is insurance? What kind was first used?

Who is the underwriter? What is the premium?

What is marine insurance?

If goods insured are removed from a burning building and are damaged who loses?

Is a loss by lightning the same as by fire? Why did life insurance originate?

What is an endowment policy? What is the tontine policy?

What are examples of a corporation for the benefit of the members?

What is the basis of a corporation for the pecuniary profit of individual members?

How are such corporations regulated? To what are their transactions limited? How are the profits divided?

Give examples of this class of corporations.

What is the first object of corporations for mutual aid and relief?

How are such corporations generally controlled? What are examples of this class?

What are examples of incorporated trusts?

How is a corporation usually formed?

Give four conditions under which a corporation may be dissolved.

In all such cases what becomes of the lands of a corporation?

To what laws are corporations liable?

What privileges does the constitution of the United States prohibit?

What is one of the first principles of corporation law?

What by-laws has a corporation power to make? With what must these by-laws be in harmony?

He teaches best who enables his pupils to dispense with his aid as he governs best who makes his rule unnecessary.

—*Bishop Spalding.*

Literature

Literature is ever young, ever helpful, ever inspiring. So varied are its departments, so wide its scope, so universal its application that no one can escape its benign influence if once he comes heartily in contact with it. Whatever in printed matter brightens, vivifies, uplifts and encourages, that is true literature. Sometimes the spirit emanates from a phrase, a sentence, a paragraph. Again it is a lyric, a drama or a beautiful story that catches the attention, stirs the feelings and molds the character. Whichever it be, it is true literature if it seizes the soul.

Prose and Poetry are the two great divisions of literature, differing widely in their form, but much alike in their essence. To some minds one form makes a stronger appeal than the other, but both will charm the open-minded. While prose may have more intellectual uplift, poetry appeals more strongly to the sense of beauty, beauty in form, in sentiment, in music.

Orations, Essays, Novels, Stories, Fables, such are varied kinds of prose that literature offers; and in poetry there are Epics and Lyrics, with the subordinate classes, Ballads, Odes, Elegies and Sonnets. What a range that is, and how varied its nature! For the gay hours there are lively stories by Kipling, rollicking lyrics by Holmes; for times of doubt the inspiring songs of Longfellow and the courageous essays of Emerson; for times of grief the heartfelt lines of Lowell, the encouraging couplets of Tennyson. No phase of mind is so peculiar that its nature is not known to the great-hearted men who have written for us.

To the young literature is as interesting as a new toy whose working they would know; to the middle-aged, a recreation and an inspiration; to the old, a comfort and a solace. Strangely enough, the same selection may affect thus differently at the same time people of all ages.

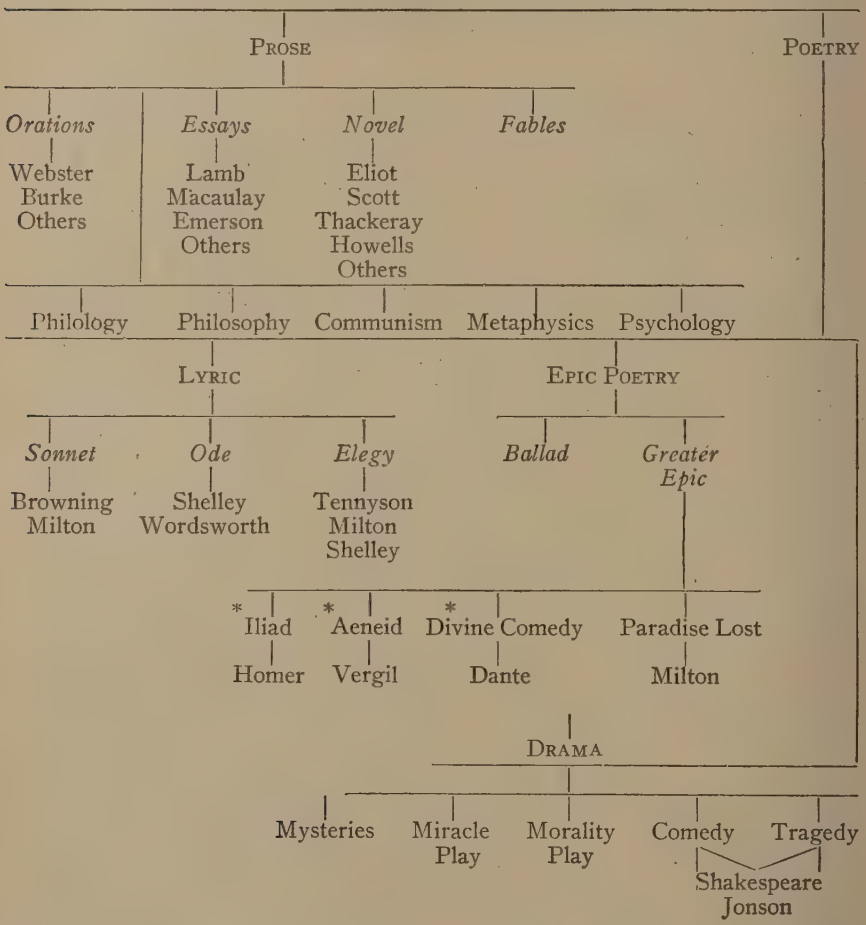
If in the family circle or at school there has been created a desire to read, the desire should be satisfied and the desire converted into a distinct good taste in selection. This may be done if proper books are placed in the hands of the learner. Here is seen the immense value of such an article as that on READING in THE NEW PRACTICAL REFERENCE LIBRARY. To this the parent or teacher can go to find directions for reading and to get lists of books adapted to children or to adults. There too will be found references to articles in the REFERENCE LIBRARY which will carry the reader far into those generous fields of literature which have in them food for every mind.

There will be found hundreds of interesting biographies of well-known writers of every nation throughout the work, giving a list of their writings and in many instances the circumstances under which they were written.

The accompanying outline touches only the literature of England and the United States. It is thought that the cross references in the other sections of the article LITERATURE are self-explanatory.

The outline on *English and American Literature* has been put in graphic form, but has not been carried out to its utmost. For instance, in the discussion of *Poetry,* many more sonneteers, writers of odes and elegists are to be found than are mentioned in the table. The same is true, of course, under *Drama,* but you will note that there are but four great epics of world-wide importance; those are named and the author of each is given.

English and American Literature



*Translations.

English Literature

(1500 TO PRESENT TIME.)

I. ELIZABETHAN AGE.
  1. Poets and their Principal Works.
    a. Non-Dramatic.
      Edmund Spenser. 1552-1599.
        Shepheardes Calendar.
        Faery Queen.
    b. Dramatic.
      William Shakespeare. 1564-1616.
        As You Like It.
        The Tempest.
        The Merchant of Venice.
        Hamlet.
        Othello.
        Macbeth.
      Ben Johnson. 1573-1637.
        Every Man in His Humor.
  2. Prose Writers and Their Principal Works.
    a. Historical.
      Sir Walter Raleigh. 1552-1618.
        History of the World.
    b. Theological.
      Richard Hooker. 1553-1600.
        The Ecclesiastical Polity.
    c. Philosophical.
      Francis Bacon.
        Novum Organum (New Instrument).
        Essays.

II. THE AGE OF MILTON.
  1. Poets and Their Principal Works.
    a. John Milton. 1608-1674.
        Paradise Lost.
        L'Allegro.
        Il Penseroso.
    b. Abraham Cowley. 1618-1667.
        Davideis.
  2. Prose Writers and Their Principal Works.
    a. Izaak Walton. 1593-1683.
        The Compleat Angler.
    b. Jeremy Taylor. 1613-1667.
        Holy Living and Holy Dying.
    c. Dr. Richard Baxter. 1615-1691.
        The Saints' Everlasting Rest.
        Call to the Unconverted.
    d. John Milton.
        Areopagitica.
        Tenure of Kings and Magistrates.

III. THE AGE OF RESTORATION.
  1. Poets and Their Principal Works.
    a. John Dryden. 1631-1700.

Alexander's Feast.
Religio Laici.
Hind and Panther.

2. Prose Writers and Their Principal Works.
   a. John Bunyan. 1628-1688.
      Pilgrim's Progress.
      Life and Death of Mr. Badman.
   b. John Locke. 1632-1704.
      Essay Concerning Human Understanding.
   c. Sir Isaac Newton. 1642-1727.
      The Principia.
      Optics.

IV. Augustan Age.

1. Poets and Their Principal Works.
   a. Alexander Pope. 1688-1744.
      Essay on Man.
      Iliad.
      Dunciad.
   b. Edward Younge. 1681-1765.
      Night Thoughts.
      Revenge.

2. Prose Writers and Their Principal Works.
   a. Joseph Addison. 1672-1719.
      Sir Roger de Coverly Papers.
      Essays.
   b. Richard Steele. 1672-1729.
      Essays.
   c. Jonathan Swift. 1667-1745.
      Gulliver's Travels.
      Journal to Stella.
   d. Daniel Defoe. 1661-1731.
      Robinson Crusoe.
      Journal of the Plague Year.

V. The Age of Johnson.

1. Poets and Their Principal Works.
   a. Thomas Gray. 1716-1771.
      Elegy Written in a Country Churchyard.
      The Bard.
   b. Oliver Goldsmith. 1728-1774.
      The Vicar of Wakefield.
      The Traveler.
      She Stoops to Conquer.
      The Deserted Village.
   c. William Cowper. 1731-1800.
      The Task.
      The Diverting History of John Gilpin.
   d. Robert Burns. 1759-1796.
      Cotter's Saturday Night.
      Tam O'Shanter.

2. Prose Writers and Their Principal Works.
   a. Samuel Johnson. 1709-1784.
      Rasselas.

b. David Hume. 1711-1776.
History of England.
Essays.
c. Edward Gibbon. 1737-1794.
Decline and Fall of the Roman Empire.
d. Edmund Burke. 1729-1797.
Speech Against Hastings.
On Conciliation with America.
e. Adam Smith. 1723-1790.
Wealth of Nations.

VI. Age of Scott.
1. Poets and Their Principal Works.
a. Walter Scott. 1771-1832.
The Lady of the Lake.
Marmion.
Lay of the Last Minstrel.
b. George Gordon Byron. 1788-1824.
Childe Harold's Pilgrimage.
Don Juan.
The Giaour.
c. John Keats. 1795-1821.
Endymion.
Eve of Saint Agnes.
Hyperion.
Lamia.
2. The Lake School.
a. William Wordsworth. 1770-1850.
Ode on Immortality.
Lines on Tintern Abbey.
The Excursion.
We Are Seven.
b. Samuel Taylor Coleridge. 1772-1834.
The Ancient Mariner.
Kubla Khan.
Christabel.
c. Robert Southey. 1774-1843.
Joan of Arc.
Roderick the Last of the Goths.
The Curse of Kehama.
d. Percy Bysshe Shelley. 1792-1822.
Queen Mab.
Ode to the West Wind.
Ode to a Skylark.
3. Prose Writers and Their Principal Works.
a. Novelist.
Walter Scott. 1771-1832.
Ivanhoe.
Kenilworth.
Quentin Durward.
Guy Mannering.
b. Essayist.
Charles Lamb. 1775-1834.
Tales from Shakespeare.
Essays of Elia.

VII. Victorian Age.

1. Poets and Their Principal Works.

a. Alfred Tennyson. 1809-1892.
The Princess.
In Memoriam.
Idylls of the King.
Maud.

b. Elizabeth Barrett Browning. 1806-1861.
Sonnets from the Portuguese.
Aurora Leigh.
Prometheus Bound.

c. Robert Browning. 1812-1889.
My Last Duchess.
Andrea del Sarto.
The Ring and the Book.
Rabbi Ben Ezra.

d. Thomas Babington Macaulay. 1800-1859.
Lays of Ancient Rome.
The Battle of Ivry.

e. Jean Ingelow. 1820-1897.
Divided.

2. Prose Writers and Their Principal Works.

a. Historical.
Thomas Babington Macaulay.
History of England.
Henry Hallam. 1777-1859.
Constitutional History of England.
James Anthony Froude. 1818-1894.
History of England.
Thomas Carlyle: A History.

b. Essayists.
Thomas DeQuincey. 1785-1859.
Confessions of An Opium Eater.
Joan of Arc.
The English Mail Coach.
Thomas Carlyle. 1795-1881.
Sartor Resartus.
French Revolution.
John Ruskin. 1819-1900.
Seven Lamps of Architecture.
Stones of Venice.
Sesame and Lilies.

c. Theological.
John H. Newman. 1801-1890.
Apologia pro Vita sua.
Lead Kindly Light.
C. H. Spurgeon. 1834-1892.
The Saint and His Saviour.
Speeches at Home and Abroad.

d. Scientific.
Sir William Hamilton. 1788-1856.
Discussions on Philosophy and Literature.

Sir Charles Lyell. 1797-1875.
Elements of Geology.
Antiquity of Man.
Charles Darwin. 1809-1822.
*Origin of Species.
Descent of Man.
Thomas Huxley. 1825-1895.
Man's Place in Nature.
Elements of Comparative Anatomy.
Herbert Spencer. 1820-1902.
First Principles.

e. Novelists.
Charles Dickens. 1812-1870.
Pickwick Papers.
David Copperfield.
Nicholas Nickleby.
William Makepeace Thackeray. 1811-1863.
Henry Esmond.
The Newcomes.
Vanity Fair.
George Eliot. 1819-1880.
Silas Marner.
Adam Bede.
Felix Holt.

VIII. Modern Period.

1. Poets and Their Principal Works.
   a. Dante Gabriel Rossetti. 1828-1882.
      The House of Life.
      The Blessed Damozel.
   b. Matthew Arnold. 1822-1888.
      Sohrab and Rustum.
      Dover Beach.
   c. Algernon Charles Swinburne. 1837-
      A Song of Italy.
      Poems and Ballads.
2. Prose Writers and Their Principal Works.
   a. Charles Kingsley. 1819-1875.
      Hypatia.
      Westward Ho.
   b. Robert Louis Stevenson. 1850-1894.
      Dr. Jekyll and Mr. Hyde.
      Treasure Island.
   c. Rudyard Kipling. 1865-
      The Jungle Book.
      Kim.

American Literature

I. Colonial Period.
1. Poets and Their Principal Works.
a. Anne Dudley Bradstreet. 1612-1672.
The Tenth Muse.
2. Prose Writers and Their Principal Works.
a. Thomas Hooker. 1586-1647.
Fundamental Orders—First Written Constitution.
b. Cotton Mather. 1667-1728.
Witchcraft.
Wonders of the Invisible World.
Magnalia.
c. Jonathan Edwards. 1703-1758.
Freedom of the Will.
d. Benjamin Franklin. 1706-1790.
Poor Richard's Almanac.
Essays.
Autobiography.

II. Revolutionary Period.
1. Poets and Their Principal Works.
a. Philip Freneau. 1752-1832.
The British Prison Ship.
Political Poems.
b. John Trumbull.
c. Francis Scott Key. 1780-1843.
Star Spangled Banner.
2. Prose Writers and Their Works.
a. Alexander Hamilton. 1757-1804.
The Federalist.
b. Thomas Jefferson. 1743-1826.
Rights of British America.
Declaration of Independence.
c. James Madison. 1751-1836.
The Federalist.
d. William Wirt.
e. Charles B. Brown. 1771-1810.
Wieland.

III. National Period.
1. Poets and Their Principal Works.
a. William Cullen Bryant. 1794-1878.
Thanatopsis.
My Country's Call.
The Ages.
Flood of Years.
Translation of the Iliad and Odyssey.
b. Henry Wadsworth Longfellow. 1807-1882.
Evangeline.
Hiawatha.
The Spanish Student.
The Courtship of Miles Standish.
Translation of Dante's Divine Comedy.
c. John Greenleaf Whittier. 1807-1892.
The Barefoot Boy.
Snowbound.
Maud Muller.
Among the Hills.
d. James Russell Lowell. 1819-1891.
The Commemoration Ode.
The Vision of Sir Launfal.
The Cathedral.
e. Oliver Wendell Holmes.
Old Ironsides.
The Poet at the Breakfast Table.
The Chambered Nautilus.
The Last Leaf.
Wonderful One-Hoss Shay.
f. James Whitcomb Riley. 1853—
The Old Swimmin' Hole.
Afterwhiles.
Rhymes of Childhood.
g. Eugene Field. 1850-1895.
Little Boy Blue.
Jes' 'Fore Christmas.
Seein' Things.
2. Prose Writers and Their Principal Works.

Historians.
a. George Bancroft. 1800-1891.
The United States of North America.
History of the Revolution in North America.
b. Richard Hildreth. 1807-1891.
The White Slave.
History of the United States.
c. William H. Prescott. 1796-1859.
Conquest of Mexico.
Conquest of Peru.
d. John L. Motley. 1814-1877.
The Rise of the Dutch Republic.
The United Netherlands.
The Life of John Barneveldt.
e. Francis Parkman. 1823-1893.
California and the Oregon Trail.
The Jesuits in North America.
Montcalm and Wolfe.
f. Theodore Roosevelt. 1858—
The Naval War of 1812.
Life of Thomas H. Benton.
The Winning of the West.
American Political Ideals.

Novelists.
a. Nathaniel Hawthorne. 1804-1869.
The Scarlet Letter.
The Marble Faun.
The House of the Seven Gables.
b. James Fenimore Cooper. 1789-1851.
The Spy.
The Pilot.
The Last of the Mohicans.
c. Harriet Beecher Stowe. 1811—1896.
Uncle Tom's Cabin.
d. William Dean Howells. 1837—
A Modern Instance.
Venetian Life.
A Foregone Conclusion.
e. Mary E. Wilkins Freeman. 1862—
Jerome, a Poor Man.
The Portion of Labor.
f. Henry James. 1834—
Daisy Miller.
A Passionate Pilgrim.

ESSAYISTS.
a. Ralph Waldo Emerson. 1803-1882.
Representative Men.
The Conduct of Life.
b. Horace Mann. 1796-1859.
Common School Journal.
Lectures on Education.
c. William E. Channing.
Sermons and Reviews.

CRITICS.
a. James Russell Lowell.
My Study Windows.
Among My Books.

HUMORISTS.
a. Joel Chandler Harris. 1848—
Uncle Remus.
Tales of the Home Folks.
Daddy Jake.
A History of Georgia.
b. Samuel L. Clemens. 1835—
Innocents Abroad.
Pudd'nhead Wilson.
The Prince and the Pauper.

MISCELLANEOUS WRITERS.
a. Washington Irving.
Sketch Book.
b. Bayard Taylor. 1825-1876.
Travel.
Translation of Goethe's Faust.
c. J. G. Holland.
Nicholas Minturn.
Kathrina.
Garnered Sheaves.
d. George Ticknor. 1791-1871.
History of Spanish Literature.
Life of Prescott.
e. Charles Dudley Warner. 1829-1900.
My Summer in a Garden.
As We Were Saying.
The Gilded Age.
f. Silas Weir Mitchell. 1829—
Youth of Washington.
Hints for the Overworked.
g. Thomas Bailey Aldrich. 1836-1907.
Cloth of Gold.
The Story of a Bad Boy.
Flower and Show.
Baby Bell.

Drama

I. FORMS.
1. Tragedy.
a. Subject matter serious or classic.
b. Language dignified and graceful.
c. Motive of presentation—purification of passions.
2. Comedy.
a. Less serious than tragedy.
b. Treatment somewhat light throughout.
c. Originally used as means of ridicule.
3. Opera.
a. General—Dramatic composition set to music and sung by the artists, enriched by the costumes, scenery, music, etc.
b. Grand—Usually serious or classical themes. Generally heavy and impressive treatment, although it is sometimes of a lighter vein.
c. Comic—Light, fanciful or humorous. Treatment light and graceful. Oftentimes means of ridicule.
4. Pastoral.
a. Aimed at a fanciful portrayal of Arcadian and mythological scenes.
b. Treatment quiet and in keeping with the subjects.
5. Burlesque.
a. Depicts dignified and serious subjects of life in a ludicrous manner or vice versa.
b. Means of satirical criticism.
c. Modern—Mixture of travesty, vaudeville and ballet.
6. Farce.
a. More extravagant and ludicrous than the comedy. Any absurdity or improbability is allowable.
b. Motive—To excite laughter in any event.

7. Mysteries.
    a. Rude drama presented at solemn festivals; religious in character.
    b. Object—To strengthen Christian church.
    c. Extended from twelfth to sixteenth centuries. Passion play Oberammergau is an example.
8. Moralities.
    a. Allegorical play. Moral discourse praising virtue and condemning vice.
    b. Object—To influence public sentiment toward right living.

II. DEVELOPMENT.

1. Old Testament.
    a. Job.
    b. Songs of Solomon.
2. India.
    a. Drama much inferior to Greek or modern European.
    b. Dramatic poetry elegant and tender. Writings voluminous.
3. China.
    a. Dramatic writings extensive but unknown to other peoples.
4. Greece.
    a. European drama originated in Greece, foremost nation in literature in early times.
    b. Drama at first was celebrations of festivals of Bacchus, god of wine.
    c. Æschylus, first writer of Greek tragedy, wrought many changes in chorus, number of actors, etc.
5. Rome.
    a. Drama borrowed from Greeks. In a sense imitators.
    b. Became powerful and influenced modern literature more forcibly than Greece.
6. Italian.
    a. Foundation of the drama as portrayed by Shakespeare came directly from Italian.
    b. At first classic models were subjects.
    c. Great periods were during fourteenth, fifteenth and sixteenth centuries. Noted pastoral dramas occurred.
    d. Interest waned in seventeenth century.
    e. Eighteenth century classic tragedy and genuine comedy were restored.
7. French.
    a. 1684 early school of dramatic writings flourished.
    b. Voltaire, Moliere, the distinguished dramatists.
    c. 1820 a new school of art was formed, called the romantic, in contrast to the former classical subjects. Hugo promoted this school largely.
    d. Writers in this school, Sardou, Dumas, Rostand.
8. Spanish.
    a. The drama flourished at the same time as the English and rose to its height at the same time.
9. English.
    a. Last half of the sixteenth century marked the height of the most brilliant period of the English drama.
    b. Writers—Spenser, Johnson, Bacon, Shakespeare.
    c. Theaters were shut up for thirteen years by Puritans.

d. With Charles II the drama reappeared. Licentious and degrading treatment.

10. German.
    a. At first merely translations from the French.
    b. Original works appeared later on.
    c. Schiller and Goethe greatest of modern dramatists.

Shakespeare

BIRTH.

1. Born at Stratford-on-Avon, 1564.

PARENTS.

1. Of humble origin; respectable tradespeople; financially well-to-do.

EDUCATION.

1. Best education grammar school offered.

MARRIAGE.

1. Nineteen years of age. In 1592 established in London, engaged in literary work, and also taking some of the leading parts.

CHARACTER.

1. Ben Jonson said: "I loved the man and do honor to his memory, on this side idolatry, as much as any. He was indeed honest and of an open nature; had an excellent phantasy, brave notions and gentle expressions."

WRITINGS.

1st Period.
    a. Experimenting in characterization; looseness in construction. Feeling after his powers and testing them.
    b. Writings—Love's Labor Lost, The Comedy of Errors, A Midsummer Night's Dream, Richard III.

2d Period.
    a. With increased assurance follows his brilliant portrayal of English history, comedy of life in general and one great romantic tragedy, King Richard II.
    b. Writings—Parts I and II of Henry IV, King John, Romeo and Juliet, The Merchant of Venice, Much Ado About Nothing, As You Like It, etc., etc.

3d Period.
    a. Master of all the resources of his art.
    b. Personal experiences portrayed in writings. Comedy becomes bitter; tragedies black with human experiences.
    c. Writings—Measure for Measure, Julius Cæsar, Hamlet, King Lear, etc., etc.

4th Period.
    a. Attains glad serenity of mind, enabling him to write his last romantic plays.
    b. Writings—Chiefly poetry.

DEATH.

1. Dies in 1616. Buried in Stratford church; a monument with bust and epitaph was soon afterward set up.

QUESTIONS.—LITERATURE.

How was James Fenimore Cooper connected with the navy and consular service of the United States?

Who was the friend of Emerson whose genius in certain respects much resembled that of the philosopher?

What is the nature of Bret Harte's humor?

How was William Dean Howells connected with the foreign administration of the United States?

In what practical way did Washington Irving get the material for his "Tour on the Prairies?"

In which of Elizabeth Stuart Phelps' works appears the problem of woman in professional life?

James Whitcomb Riley began life in what humble way? What is his most famous poem?

What famous novel on social work did Edward Bellamy write?

In what periodical did Mrs. Stowe first publish "Uncle Tom's Cabin?"

What was the hermit period of Thoreau's life?

When was the first edition of Webster's dictionary published?

In what philanthropic work did Walt Whitman ruin his health?

What distinct style of literature did Addison found?

Who described Francis Bacon as the "wisest, brightest, meanest of mankind?"

Which is the longest and most polished of Mrs. Browning's works?

To what romantic circumstances was the publication of Burns' first book of poems due?

For what calling was Carlyle trained? What educational endowment did he make?

Which of Dickens' works embodied his experiences in America?

Which are Henry Drummond's three best-known works?

What was the novel that established George Eliot's high rank?

In the verse of what language is Thomas Gray almost unsurpassed?

What is the elegy in which Shelley has honored his friend Keats?

In what novel do Kingsley's opinions on social and economic questions appear?

At what exceptionally early age was Pope recognized as an able poet?

Which of Charles Reade's novels was directed against the English prison system?

What desire of Walter Scott eclipsed even his literary ambition?

What class of people did Swift try to better and to what end did he bequeath his fortune?

When did Tennyson become poet laureate and what was the first great poem written after the event?

What career did Thackeray first plan for himself and why did he give it up?

To what subject is the literary talent of Israel Zangwill devoted?

What work of Hans Christian Andersen was written by him in English?

What was the period of Goethe's and Schiller's intimate association?

What constitutes the strength and what the defective element in Jean Paul Richter's works?

What was the tragic death of Æsop?

How does Aristophanes rank in Grecian literature?

How did Herodotus prepare himself for his great work? What well-known appellation has been given him?

In which of his writings is Horace at his best?

What was Livy's great purpose in his works?

What peculiar circumstance directed Virgil toward a literary career?

Whose translation of the Æneid has become most popular?

For what reason has the history of Dante's life become half mythical?

Has Dumas a rightful claim to the 1,200 volumes which bear his name?

What is the characteristic of Jules Verne's writings which makes them appeal to readers of all ages?

For what is Emile Zola noted?

What positions did Bjornson and Ibsen hold together during their lives?

What is literature? How old is it?

What is the first account we have of a book? On what was it written?

How old is Sanskrit Literature? Chinese?

What is Poetry? Prose? What is a Lyric? An Epic? A Sonnet? An Ode?

Name the divisions into which prose is sub-divided.

What is the difference between an essay and an oration?

When did Chaucer live? What is he popularly called as relates to English Poetry?

When, where, and by whom was printing invented? When was the first book printed?

Where and when was Shakespeare born? When did he die? Where is he buried?

How does Shakespeare rank as a dramatist?

Name five of his most noted productions.

Name five contemporary writers of Shakespeare.

Who wrote "Paradise Lost"?

For what was Spencer noted?

When did Burns live? Name some of his noted poems.

Is Walter Scott more famous for his poems than for his novels? What caused Scott to give up poetry for prose? What are his most famous novels? Name three.

When did Tennyson live? What was the character of his poems?

What famous American orator lived during the Revolutionary War?

For what was Franklin chiefly noted in the field of literature?

Who wrote "The Star Spangled Banner"? "Home, Sweet Home"? "America"?

Who is the best known American poet? Novelist? Essayist? Historian?

For what is James Whitcomb Riley best known?

Name three prose writers and three poets of the United States living today.

Why is the study of literature so important? Give three reasons for your answer.

Why was Whittier called the Quaker poet?

For what production is Oliver Wendell Holmes best remembered? Lowell? Hawthorne? Cooper?

Yet Love will dream and Faith will trust
(Since He who knows our need is just)
That somehow, somewhere, meet we must.
Alas for him who never sees
The stars shine through his cypress trees!
Who, hopeless, lays his dead away,
Nor looks to see the breaking day
Across the mournful marbles play!
Who hath not learned, in hours of faith,
The truth to flesh and sense unknown.
That Life is ever lord of Death,
And Love can never lose its own!

—"Snowbound," *Whittier.*

Gems of Literature

We give here fifty-two selections from as many eminent authors and literary personages. As the pupils become familiar with the world's best thoughts they will unconsciously adopt them as their own and ever be actuated by them. These splendid lessons on character ,education, industry, sincerity, truth, wisdom and kindred subjects, supplemented with the lives of their authors, as given in THE NEW PRACTICAL REFERENCE LIBRARY, should prove of inestimable value.

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The only way to succeed in such an effort is by systematic study, and if ten minutes each day for only one year be given to this work the fund of information acquired will prove a happy surprise and this single acquirement amply repay the small investment made in THE NEW PRACTICAL REFERENCE LIBRARY.

Talk not to me of the stock whence you grew,
But show me your stock by what you can do.
—*Spurgeon.*

Lost, yesterday, somewhere between sunrise and sunset, two golden hours, each set with sixty diamond minutes. No reward is offered, for they are gone forever. —*Horace Mann.*

Breathes there a man with soul so dead,
Who never to himself hath said,
"This is my own, my native land?"
Whose heart hath ne'er within him burned,
As home his footsteps he hath turned
From wandering on a foreign strand?
—*Sir Walter Scott.*

Do not look for the flaws as you go through life,
And even when you find them,
It's wise and kind to be somewhat blind,
And look for the virtue behind them. —*Wilcox.*

Laziness grows on people; it begins in cobwebs and ends in iron chains. The more business a man has to do, the more he is able to accomplish, for he learns to economize his time. —*Sir Matthew Hale.*

Do the duty which lies nearest thee, which thou knowest to be a duty. Thy second duty will already have become clearer. —*Carlyle.*

I would not enter on my list of friends
(Though graced with polished manners and fine sense,
Yet wanting sensibility) the man
Who needlessly sets foot upon a worm. —*Cowper.*

If a task is once begun,
Never leave it till it's done;
Be the labor great or small,
Do it well, or not at all. —*Phœbe Cary.*

Happy hearts and happy faces,
Happy play in grassy places—
That was how, in ancient ages,
Children grew to kings and sages.
—*Robert Louis Stevenson.*

Diving and finding no pearls in the sea,
Blame not the ocean: the fault is in thee. —*Alice Cary.*

Awake, he loved their voices,
  And wove them into his rhyme;
And the music of their laughter
  Was with him all the time.

Though he knew the tongues of nations,
  And their meanings all were dear,
The prattle and lisp of a little child
  Was the sweetest for him to hear.
—"About Longfellow," by *Riley.*

We sow a thought and reap an act; we sow an act and reap a habit; we sow a habit and reap a character; we sow a character and reap destiny. —*Thackeray.*

People seldom improve when they have no other model but themselves to copy after.
—*Goldsmith.*

The only reason we don't see good things everywhere is because we haven't good eyes.
—"A Fool of Nature," *Julian Hawthorne.*

Ah, faithful to Little Boy Blue they stand,
  Each in the same old place,
Awaiting the touch of a little hand,
  The smile of a little face.
And they wonder, as waiting these long years through,
  In the dust of that little chair,
What has become of our Little Boy Blue
  Since he kissed them and put them there.
—"Little Boy Blue," *Eugene Field.*

Then here's to our boyhood, its gold and its gray!
The stars of its winter, the dews of its May!
And when we have done with our life lasting toys,
Dear Father, take care of Thy children—The Boys.
—"The Boys," *Oliver Wendell Holmes.*

Do you count your birthdays by the year,
And thank the gods with gladness and good cheer,
O'erlook the failings of your friends, and grow
Gentler and better as your sands run low?
—A Prayer for Health and Content.
Translation from "Horace" by *Conington.*

With malice toward none, with charity for all; with firmness in the right, as God gives us to see the right, let us finish the work we are in—to bind up the nation's wound; to call for him who shall have borne the battle and for his widow and his orphans; to do all which may achieve and cherish a just and lasting peace among ourselves and with all nations.
—Speech at Gettysburg, *Abraham Lincoln.*

He who, from zone to zone,
  Guides through the boundless sky thy certain flight,
In the long way that I must tread alone,
  Will lead my steps aright.
—"Ode to a Waterfowl," *Wm. Cullen Bryant.*

Errors, like straws, upon the surface flow;
He who would search for pearls must dive below.
—*John Dryden.*

In battle or business, whatever the game,
In war or in love, it's ever the same;
In the struggle for power, or scramble for pelf,
Let this be your motto, "Rely on yourself." —*Saxe.*

Our greatest glory consists not in never falling, but in rising every time we fall.
—*Emerson.*

My son, observe the postage stamp! Its usefulness depends upon its ability to stick to one thing until it gets there. —*Josh Billings.*

But chief of all,
O loss of sight, of thee I most complain!
Blind among enemies, O worse than chains,
Dungeon, or beggary, or decrepit age!
Light, the prime work of God, to me's extinct,
And all her various objects of delight
Annulled, which might in part my grief have eased;
Inferior to the vilest now become
Of man or worm the vilest here excel me.
They creep, yet see; I, dark in light, exposed
To daily fraud, contempt, abuse and wrong,
Within doors or without, still as a fool
In power of others, never in my own
Scarce half I seem to live, dead more than half. —*Milton.*

Beware of how you say more than you mean; better mean more than you say.
—*Gladstone.*

The moment I heard of America, I loved her; the moment I knew she was fighting for freedom, I burnt with a desire of bleeding for her; and the moment I shall be able to serve her at any time or in any part of the world, will be the happiest one of my life.
—*Lafayette.*

I steal by lawns and grassy plots,
I slide by hazel covers;
I move the sweet forget-me-nots
That grow for happy lovers.

I chatter, chatter as I flow
To join the brimming river;
For man may come and man may go,
But I go on forever. —"The Brook," *Tennyson.*

It is nearly an axiom, that people will not be better than the books they read.
—*Bishop Potter.*

We grow like what we think of; so let us think of the good, the true, and the beautiful.
—*Phillips Brooks.*

Ponder well, and know the right,
Onward, then, with all thy might!
Haste not! years can ne'er atone
For one reckless action done. —*Goethe.*

I hope I shall always possess firmness and virtue enough to maintain what I consider the most enviable of all titles, the character of an "Honest Man." —*George Washington.*

My idea is this: ever onward. If God had intended that man should go backward, He would have given him an eye in the back of his head. —*Victor Hugo.*

Boys flying kites haul in their white winged birds;
You can't do that way when you're flying words.
"Careful with fire," is good advice, we know;
"Careful with words," is ten times doubly so.
Thoughts unexpressed may sometimes fall back dead;
But God himself can't kill them when they're said.
—*Will Carleton.*

The next gale that sweeps from the north will bring to our ear the clash of resounding arms. Our brethren are already in the field! Why are we here idle? What is it that gentlemen wish? What would they have? Is life so dear or peace so sweet as to be purchased at the price of chains and slavery? Forbid it, Almighty God! I know not what course others may take; but as for me, give me liberty or give me death. —*Patrick Henry.*

So, Willy, let you and me be wipers
Of scores out with all men—especially Pipers;
And whether they pipe us free from rats or from mice,
If we've promised them aught, let us keep our promise.
—"The Pied Piper of Hamelin," *Robert Browning.*

Which is the wind that brings the heat?
The South wind, Katy; and corn will grow
And peaches redden for you to eat,
When the South begins to blow.
—"What the Wind Brings," *Edmund Clarence Stedman.*

He prayeth best who loveth best
All things both great and small;
For the dear God who loveth us,
He made and loveth all. —*Samuel Taylor Coleridge.*

Full many a gem of purest ray serene
The dark unfathomed caves of ocean bear;
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air.
—"Elegy in a Country Churchyard," *Thomas Gray.*

Nothing useless is and low,
Each thing in its place is best;
And what seems but idle show
Strengthens and supports the rest. —*Longfellow.*

Sloth, like rust, consumes faster than labor wears; while the used key is always bright.
—*Benjamin Franklin.*

A mere life of ease is not in the end a satisfactory life, and, above all, it is a life which ultimately unfits those who follow it for serious work in the world. —*Roosevelt.*

Honor and shame, from no condition rise;
Act well your part, there all the honor lies. —*Pope.*

Not what we give, but what we share,
For the gift without the giver is bare;
Who gives himself with his alms feeds three—
Himself, his hungering neighbor and me. —*Lowell.*

Be good, dear child, and let who will be clever,
Do noble things, not dream them all day long;
And so make life, death, and that vast forever
One grand sweet song. —*Chas. Kingsley.*

Strike—for your altars and your fires;
Strike—till the last armed foe expires;
Strike—for the green graves of your sires,
God—and your native land! —*Fitz Greene Halleck.*

There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows, and in miseries. —*Shakespeare.*

He smote the rock of the national resources, and abundant streams of revenue gushed forth. He touched the dead corpse of Public Credit, and it sprang upon its feet.
—Speech on Hamilton, March 10, 1831.—*Webster.*

But words are things, and a small drop of ink,
Falling, like dew, upon a thought, produces
That which makes thousands, perhaps millions, think. —*Byron.*

Unanchor'd ships, they blow and blow,
Sail to and fro, and then go down,
In unknown seas that none shall know,
Without one ripple of renown.
Poor, drifting dreamers sailing by,
They seem to only live to die. —*Joaquin Miller.*

I care not that sharp thorns grow thick below
And wound my hands and scar my anxious feet:
I only care to know God's roses grow,
And I may somewhere find their odor sweet.
—"Care and Carelessness," *Frank W. Gunsaulus.*

Every person has two educations—one which he receives from others, and one, more important, which he gives himself. —*Gibbon.*

Machines and Engineering

Under the general subject of ENGINEERING we have called attention to the different departments and outlined the work of each. Under CIVIL ENGINEERING we include all kinds of construction other than military and naval. These topics are treated under their separate heads, as CANALS, RAILROADS, HARBORS, WATERWORKS, IRRIGATION, etc.

As TRANSPORTATION is really a subhead of ENGINEERING, a study of our Outline on TRANSPORTATION will be beneficial, as will also the article itself in THE NEW PRACTICAL REFERENCE LIBRARY. together with its subheads. This is one of the most important questions of the day, of interest both to the individual and nation alike, and a close examination of the different lines of work as described in the LIBRARY ought to give a very comprehensive view of the situation in the engineering world today.

In connection with our outline of ENGINEERING we append the names of important machines which constitute such an important factor in the problems confronting ENGINEERING today. These are treated fully under their own heads.

ENGINEERING.

I. DEFINITION.
II. HISTORY OF.
III. GENERAL PURPOSE.
    1. Construction of
        a. Large buildings.
        b. Bridges.
        c. Canals (see Outline).
        d. Harbors.
        e. Railroads (see Outline).
        f. Street railways.
        g. Telegraph (see Outline).
        h. Telephone.
        i. Waterworks.
            Aqueduct.
            Irrigation (see Outline).
IV. DIVISIONS.
    1. Civil Engineering (see "Construction of," above).
        a. Electrical.
        b. Mechanical.
        c. Sanitary.
    2. Military Engineering.

a. Construction of roads, fortifications and other defenses for country.

3. Marine Engineering.

a. Construction of ships and other naval affairs.

V. MACHINES.

Flying Machine.
Compass.
Corn Harvester.
Cotton Gin.
Gas Engine.
Hydraulic Engine.
Hydraulic Ram.
Knitting Machine.
Linotype.
Monotype.
Locomotive.
Magic Lantern.
Microscope.
Phonograph.
Printing Press.
Reaping Machine.
Sewing Machine.
Separator—Cream.
Snow Plow.
Solar Engine.
Steam Engine.
Steam Hammer.
Steam Shovel.
Steam Turbine.
Threshing Machine.
Turbine Wheel.
Type.
Typewriter.
Voting Machine.

QUESTIONS.

In the construction of railways what are some of the obstacles to overcome by means of engineering?

In what enterprises would an electrical engineer be employed?

Name some of the machinery in use on a farm and in each case tell of the labor saved.

What ruins in Egypt attest to skill in engineering? In Rome? In Babylon?

What machines have you seen in your town? In what respect are they labor-saving?

What record has Santos Dumont made in aerial navigation? What part did his airship take in the St. Louis exposition?

Is the airship at present of any practical importance? What is said of its future?

What is a compass? Where is it necessary to use one? Why?

Compare the amount of work accomplished by the cotton gin in one day with that of one person for a day.

How did this invention affect the world?

In the gas engine what materials are used to generate the gas?

In what cases is an hydraulic engine preferred?

When is it practicable to use an hydraulic ram?

The knitting machine is used in what factories?

What is the linotype? It does the work of how many men working by hand?

Why and in what work is the monotype preferred to the linotype?

To what particular use is the magic lantern put?

For what is a microscope used? Its use would be an aid in what studies?

What is a phonograph? How does it differ from a graphophone? Is it ever used in business?

What are some of the late developments in the printing press?

What grains are harvested by the reaping machine? What is the chief harvester company in the United States? What is the annual business in this machine?

Name the kinds of sewing machines you have seen. What work can the sewing machine accomplish?

With what work does the cream separator do away? In what enterprise is it particularly necessary?

If a man empties his purse into his head, no man can take it away from him. An investment in knowledge always pays the best interest. —*Franklin.*

Mathematics

In the general article *Mathematics,* besides the definitions of the several branches or divisions of the subject, there are references to separate articles upon each of these subjects. In each of these articles, *Arithmetic, Algebra, Geometry, Trigonometry, Analytical Geometry* and *Calculus,* the definition and description of the field covered is given, as well as a statement of the symbols used, the fundamental operation and, in the case of *Arithmetic,* the common course of study in schools.

The article *Mathematics* also refers to the article upon each of the important subjects of which mathematics treats, namely, *Number, Angle, Line, Plane* and *Solid.* Each of these articles contains definitions of the important classes which it includes or cross-references to separate articles upon these classes. For instance, the article *Number* includes a statement concerning complex numbers and prime and composite numbers and cross-references to *Infinity* and *Infinitesimal, Negative Quantity, Imaginary Quantity;* also to *Figurate Number* and to *Number, Methods of Teaching.* The article *Solid* contains cross-references to *Cone, Cube, Cylinder, Globe, Prism, Pyramid, Sphere, Tetrahedron.* Under *Line* there is a cross-reference to *Curves.* Under *Plane* there are cross-references to *Square, Circle, Triangle, Polygon* and *Ellipse.*

Among the special processes and principles described in separate articles are *Cancellation, Factor, Fractions, Mensuration, Power, Root, Progressions, Proportion, Function, Coördinates,* etc. A special article is given to NUMBER, METHODS OF TEACHING, and this is referred to from the article METHODS OF TEACHING and from the articles ARITHMETIC and NUMBER.

The department of weights and measures is centered in two general articles, one entitled *Weights and Measures,* the other called *Unit.* In the former the common system, or English system, of weights and measures is fully described, with the values of the various units, and a cross-reference is made to the article *Metric System,* which contains a complete account of the metric system, together with tables showing its relation to the English system. Reference is also made in this article to special articles on the various common units of measurement, and in each of these articles the system of which the unit forms the base is also described. In the article UNIT the units commonly used in the physical sciences are described, and reference is also made to the article WEIGHTS AND MEASURES, and to the articles on the various common units of measurement. This division of weights and measures includes also that of coin and money. In the article *Money,* besides a discussion of the theory of money from the standpoint of economics, a table is given showing the standard units of coinage in each of the important countries, and the value of these coins relative to the gold dollar of the United States. Reference is also made in this article to the article *Currency, Banks and Banking, Clearing House,*

Mint, and to the articles on each of the important standard coins. In each of these articles the value of the unit described relative to that of the gold dollar of the United States is given, and also the equivalent of the unit in the coins of other leading nations.

OUTLINE.

I. General Article.
   1. Classification and definitions of important branches.
   2. History.

II. Branches.
   1. Arithmetic.
   2. Algebra.
   3. Geometry.
   4. Trigonometry.
   5. Analytical Geometry.
   6. Calculus.

III. Subjects.
   1. Number.
      a. Definition.
      b. Classification.
   2. Angle.
   3. Solid.
   4. Line.
   5. Plane.

IV. Processes and Principles.

V. Methods.
   1. Number, Methods of Teaching.

VI. Weights and Measures.

QUESTIONS.

The science of mathematics was developed by what nation?

In what respect does mathematics differ from all other sciences?

In what manner has it aided investigation in other sciences—notably which?

What do we mean by an exact science?

What is the simplest branch of mathematics and the one in most common use?

Mention occupations where a knowledge of mathematics is required. Where only a knowledge of arithmetic is required.

In what professions based upon arithmetic are the methods undergoing constant improvement?

What does our twentieth century business college boast of along the line of up-to-date methods?

A mastery of arithmetic should secure what results?

Can it be said that a knowledge of number is inborn? What proof have we?

What is the value of arithmetic from a business standpoint?

What traits does it establish from a mental standpoint?

What is the practical use of algebra?

In what is it superior to arithmetic?

With what does it deal? Where is it used?

Of what does geometry treat? In what lines of business is it used?

Upon what does geometry reasoning depend?

Of the following, what knowledge of mathematics is necessary: Astronomy? Physics? Engineering? Carpentering? Architecture? Surveying? Banker? Bookkeeper? Ordinary citizen?

Money

I. Uses.
   1. Medium of Exchange.
   2. Measure of Value.
   3. Standard of Value.

II. Properties.
   1. Portability.
   2. Durability.
   3. Homogeneity.
   4. Divisibility.
   5. Stability.

III. Standard.
   1. In olden times.
   2. With semi-civilized.
   3. Gold.
   4. Silver.

IV. Currency.
   1. Gold certificate.
   2. Silver certificate.
   3. Treasury notes.
   4. United States notes.
   5. National bank notes.

V. Commercial Paper.
   1. Checks.
   2. Drafts.
   3. Notes.

VI. Study of Exchange.
   1. Domestic.
   2. Foreign.

QUESTIONS.

Should you find yourself in France with a $20 goldpiece, how many francs would you get in changing it?

How many marks would the Berlin banker give you for it?

How many yen would you receive for it from the banker of Tokyo? How many liang from the banker of Peking?

When were skins, shells, etc., used as common mediums of exchange? What did this entail?

Why was not iron, lead, tin or copper adopted in place of gold and silver?

What is standard money? Token money? Bank money?

How many dollars of our money are necessary to equal the pound sterling of England?

What is the value of the Mexican dollar in the United States?

What is the standard unit and its value in the following countries: Brazil? Italy? Panama? Denmark? Spain?

Correlated subjects: Currency, Banks and Banking, Clearing House, Mint, Credit, Tender.

Mint

I. Definition.

II. Ancient.
   1. Local officer controlled issuing of money.

III. Modern.
   1. Sovereigns of foreign countries hold exclusive right to issue money.
   2. United States government has exclusive right.
      a. Location of.
      b. Number.
      c. Director appointed by whom?

IV. Processes of Coining.

V. Assay Offices Also at Mint.

QUESTIONS.

When and where was the first mint established?

When and where was the first mint established in the United States? What was the first coin issued and in what year?

How many mints are there now in the country and where located? Can you see any reason for the location of one at Carson City?

Correlated subjects: Money—Coining.

Medicine

It must be apparent to every wide-awake person that an elementary knowledge of the properties of medicine and related subjects is essential to one's comfort and well-being. The general articles on MEDICINE and SURGERY give an interesting and instructive history of the development and present-day state of perfection of these important sciences. Besides, throughout THE NEW PRACTICAL REFERENCE LIBRARY will be found scores of interesting articles covering very generally this important field of study. To know the adaptability and wholesomeness of the food we eat is essential to good health and no less important is it to know the common, accepted laws of exercise and sanitation.

We have particularly aimed to give a clear description of the symptoms and causes of the commoner diseases known to young people, such as SCARLET FEVER, DIPHTHERIA, MEASLES, and brief mention is made of the latest accepted and recognized method of treatment. We particularly wish to call the reader's attention to the splendid articles found on "ANTIDOTE," "GERM THEORY OF DISEASE," "BACTERIA," "SANITARY SCIENCE," "ATHLETICS," "APPENDICITIS," "FOOD," etc.

QUESTIONS.

Of what is medicine a science? With what does it deal?

DIVISIONS.
- Medicine proper.
- Surgery.

SUBDIVISIONS.
- Hygiene.
- Dietetics.
- Pathology.
- Nosology.
- Pathological anatomy.

THERAPEUTICS.
- a. General.
- b. Special.

SPECIAL DEPARTMENTS.
- Diseases of the skin.
- Diseases of the eye.
- Diseases of the nose.
- Diseases of the insane.
- Diseases of children.
- Military hygiene and science.

GENERAL CAUSES OF DISEASE.
- Germs.
- Resistance to healthy action.
- Breaking down of tissues, etc.

SYSTEMS OF TREATMENT.
- Early times.
  - a. Ceremonies.
  - b. Prayers.
- Vegetable treatment.
- Hydrotherapy.
- Osteopathy.
- Homeopathy.
- Allopathy.

What are the symptoms of diphtheria? Appendicitis? Scarlet fever? Measles? Smallpox?

What is vaccine? Antitoxin?

What distinguishes the physician from the surgeon?

What were the early beliefs as to the causes of disease and what the treatment?

What school of medicine upheld the bath as a panacea for all human ills?

What is homeopathy? Osteopathy? The germ theory of disease?

Is your family physician an allopath or homeopath?

If you do not know, by what means can you tell when he next has occasion to administer medicine to you?

What is an antidote? Are there poisons for which there are no antidotes? What antidotes will counteract the effects of the following poisons: Arsenic? Carbolic acid? Carbonic acid gas? Chloral? Coal Gas? Cocaine? Lye? Matches? Morphine? Nicotine? Opium? Paris green? Strychnine? Tansy? Turpentine, etc.?

We give below a limited number of closely related articles which will be found under their proper titles in the LIBRARY. The reader must constantly keep in mind that subjects should be looked for under their most natural heading; for instance, "Arsenic" would not be described under "Poison" or "Medicine," but under its own title:

Homeopathy
Dispensary
Health, Boards of
Medicine
Hygiene
Nurse
Inoculation
Antidote
Diphtheria
Smallpox
Mumps
Food
Cancer
Athletics
Chloroform
Ether
Osteopathy
Ambulance
Sanitary Science
Anatomy
Histology
Apothecary
Antitoxin
Germ Theory of Disease
Appendicitis
Scarlet Fever
Bandage
Poison
Gymnastics
Influenza
Adulteration
Mosquito, Transmission of Disease
Hospital
Insane Asylum
Disease
Physiology
Surgery
Vaccination
Hydrotherapy
Dietetics
Consumption
Measles
Allopathy
Yellow Fever
Typhoid Fever

If a genius like Gladstone carried through life a book in his pocket, lest an unexpected spare moment slip from his grasp, what should we of common abilities not resort to to save the precious moments from oblivion?

Believe me when I tell you that thrift of time will repay you in after life with a usury of profit beyond your most sanguine dreams, and that waste of it will make you dwindle alike in intellectual and moral stature beyond your darkest reckoning. —*Gladstone.*

A true American sentiment recognizes the dignity of labor and the fact that honor lies in honest toil. —*Cleveland.*

Military and Naval

In the general articles ARMY and NAVY will be found a history of the armies and navies of all the leading nations of the world. All important wars, such as the RUSSO-JAPANESE, the SPANISH-AMERICAN, etc., are described under their respective headings. All noted battles and naval engagements, such as the BATTLE OF ANTIETAM, the BATTLE OF MANILA BAY, are described in articles to themselves, accompanied by helpful outline maps. Besides all correlated subjects are generously treated, such as NAVAL ACADEMY, MILITARY ACADEMY, NAVY, DEPARTMENT OF, ARMS AND ARMOR, ARMOR PLATE, CANNON, MUSKET, RIFLE, MILITARY SCIENCE, WARSHIPS, MILITIA, TORPEDO, SUBMARINE BOAT, TACTICS, etc. Biographies of all the leading military and naval commanders will be found throughout the work.

ARMY.

ANCIENT ARMIES.

When and where did the first military organization flourish? Who was its founder?

Who was Xerxes? Describe his invasion of Greece, and the naval battle at Salamis. How does this naval battle rank?

What army vanquished the Greek forces and excelled in spirit and discipline?

MEDIEVAL ARMIES.

What caused the disruption of the national armies of this period?

What is said of the battles of this period? What combats were common to this time?

MODERN ARMIES.

What recent wars have brought great improvements? Name three and give several improvements resulting from each.

What was the length of the battle line in the battle of Mukden? How was this made possible?

What is an intrenchment? A skirmish?

In what way are automobiles useful? Balloons? Searchlights? Range-finders? Explosives?

To what degree of perfection was sanitary science carried in the Russo-Japanese War? What was the loss in killed and wounded on each side?

UNITED STATES ARMY.

How does the size of the army of the United States compare with other leading countries?

What requirements would you have to possess and fulfill to become eligible for an appointment to West Point?

From what time does our military history date?

How many men were engaged by the Colonies in the Revolutionary War?

What was the enrollment of the regular army in 1790? In 1861?

For how many volunteers did Lincoln call in April, 1861, and for what time? What was the total number enrolled during the war?

How many men were raised by the southern states?

By the army reorganization bill of 1901, what is now the size of the standing army?

Into how many departments is our army divided? Within the limits of what department do you reside? Who is the commander?

Granting that every fifth person in the United States is liable to military service, what would be the number of men of such an army?

Is military service obligatory in Russia? In Germany? Japan? Why not in the United States?

What is the size of the British army? The French? The German? The Japanese? The Russian?

Great Battles.

Name ten and tell what side was victorious, and give the number of killed, wounded or captured.

Great Generals.

Make a list of ten, naming the principal battles in which engaged and characteristics of each.

NAVY.

General.

What is a knot? How does it compare in length with a mile?

When were commercial ships safe in olden times?

What do you understand by merchant marine?

Why have wooden war vessels been abandoned?

What are the comparative sizes of the navies of the following countries: Great Britain, Germany, Japan, United States, France, Italy, Russia?

What South American country holds first rank?

United States.

Who is commander in chief of our navy?

When was the Naval Academy established? Where is it located? What are the requirements for admission? What is done from June to September? How many cadets are allowed for each senator? For each representative?

How many men are now engaged in the American navy?

What is the cost of the navy yearly?

How many first-class battleships were in the navy in 1906? How many torpedo boats?

Going at thirty knots per hour, how long would it require a torpedo boat to cross the Atlantic, from New York to Liverpool? Would it outrun a freight train running at usual speed?

What was the cost of the Dreadnaught, one of the largest warships afloat? (See Warships.)

Describe the battle of Manila. Who commanded the American fleet? How many ships were sunk?

Who invented the Monitor?

What is a torpedo boat? A submarine boat?

Great Naval Battles.

Make a list of ten of the most noted naval battles in the world's history, in what waters they occurred, and the results.

Naval Heroes.

Name five great American and five great foreign naval commanders and tell something of interest of each.

You cannot dream yourself into a character;
you must hammer and forge yourself one.
—*Froude.*

Mythology

"MYTHOLOGY, the collective name given to the body of fables, legends or myths which grew up in almost all primitive nations regarding the creation of the world, the origin of man, the powers of nature and the adventures of the gods and heroes. It is natural that in the savage mind such questions should arise as:

What is the world?
What is man?
Who made them?
Whence came all the natural objects about us?
What causes the changes from light to darkness, from heat to cold, from life to death?"

You have been interested in the above paragraph and might be further interested to know that it is but a part of the first paragraph given in our article on MYTHOLOGY. If so, your interest will be augmented in knowing that we give a complete discussion of the ORIGIN OF MYTHOLOGY, GRECIAN AND ROMAN MYTHOLOGY, SCANDINAVIAN MYTHOLOGY and EGYPTIAN MYTHOLOGY.

This discussion will prepare us for still further examination of the subject and we append a partial list of correlated subjects included under "A" in THE NEW PRACTICAL REFERENCE LIBRARY. This work can be continued throughout the alphabet and the material all classified under their respective countries:

Achates, Acheron, Achilles, Actæon, Adonis, Ægis, Æneas, Æolus, Æsculapius, Agamemnon, Aganippe, Ajax, Albion, Alcestis, Ammon, Amphion, Andromache, Andromeda, Antæus, Antigone, Apollo, Argonauts, Argus, Ariadne, Atalanta, Atlas, Augeas, Aurora.

OUTLINE.

I. GENERAL MEANING.
II. DIVISIONS.
    1. Myths of explanation to questions asked by primitive man in regard to creation.
        a. What am I?
        b. Whence did I come?
        c. What is the world?
        d. Whence came all nature?
        e. Causes of light, darkness, life and death, etc.
    2. Myths of entertainment.
        a. Tales of adventure of gods and heroes.
III. ORIGIN AND THEORIES.
    1. Gods were mere men remembered after death by their great deeds.

2. Wise men invented them for the purpose of establishing law, through the gods appealing to mankind.
3. Inventions of poets, story-tellers, etc.
4. Myths explained all physical phenomena.

IV. Grecian and Roman.
1. Creation of all things explained by myths.
2. Planets as rulers of universe.
3. Universe divided and rulers take different abodes.
4. Abode of lesser deities.

V. Scandinavian and Northern Mythology.
1. Explanation of creation.
2. Giant Ymir first created.
3. Bori, father of all gods, appears.
4. Earth then formed from Ymir by Bori's grandsons.
5. Twelve gods and twenty-four goddesses.
6. Gods beneficent and kind.

VI. Egyptian.
1. Many religious myths; not universal as in others.
2. The stronger eventually led.
3. Distinctive belief, soul of man was immortal.

VII. Comparison of Different Myths.
1. Points of resemblance.
2. Points of difference.
3. Underlying principle same throughout.

QUESTIONS.

What great literary masterpieces are founded on Greek mythology?

What great benefits have accrued to the modern world on account of mythology?

The founding of what city famed in history is based on mythology?

Who was Achilles? Give the story of Hercules.

What was the foundation of mythology? What is its substitute in modern days?

What marked the decline of mythology? What effect would authentic history have upon it?

How does a people outgrow its mythology?

Which are the best-known mythologists?

What are the three systems of interpreting the origin of myths?

Of what monsters was Uranus the father? Who was his wife?

Which of the Titans dethroned his father and what was the ultimate fate of all twelve?

Who dethroned Cronus and became ruler of the world?

What Greek god was identified with the Roman Jupiter?

What was the ancient conception of Jupiter?

Who was next in rank to Jupiter?

What temple on the Capitoline was erected to Juno?

What was the peculiar relation of Mars to the Romans? How is he represented in art?

Who were the parents of Apollo? What did he mean to the Greeks and Romans?

With whom did Diana come to be identified?

What are the varying accounts of the parentage of Venus?

What famous statue and painting represent Venus as issuing from the sea foam?

Who was Mercury's mother? Over what did the god preside?

Who were Vesta and the vestal virgins?

What was the original number of muses?

Who was the muse of comedy?

What goddesses in northern mythology corresponded to the Greek fates?

What did Nemesis personify?

What was the ancient conception of the earth?

What animals were sacrificed to Ceres?

Who were the children of Ceres?

Who has made the Satyr celebrated in art?

What was the Greek hades?

What is a common representation of Neptune?

What expedient did Ulysses use by which he and his crew escaped the Sirens?

What terrible fate befell all those who looked upon the Gorgons?

Into what inanimate object did Zeus change Niobe?

What was Acteon's harsh fate?

In what way was Diana associated with Endymion?

Of what was Psyche a beautiful personification?

Why was Orpheus an important figure in Greek mythology?

Of what was the beautiful Aurora goddess?

What is the interesting vocal Memnon?

In what miraculous way did Perseus escape an early death?

Through whose aid did Jason secure the Golden Fleece?

What famous riddle did Œdipus solve?

Who was the bravest hero of the Trojans killed by Achilles?

What oath were the suitors of Helen compelled to take?

Osiris, representing all that is good, was opposed by what god who was a personification of evil?

Who was Dagon?

From what form of Odin's name is Wednesday derived?

How did Odin inform himself of what took place on earth?

According to Norse mythology which was the first of all things to come to life?

Who was Thor?

What is a vampire?

How is our word tantalize naturally derived from Tantalus?

Correlated subjects: Baldeŗ, Freya, Frigga, Lok, Odin, Thor, Tyr, Hercules, Minerva, etc.

The habit of laying up in the memory what has not been digested by the understanding is at once the cause and the effect of mental weakness. —*Sir W. Hamilton.*

Next to acquiring good friends, the best acquisition is that of good books. —*Colton.*

Nature Study

There is no subject of greater interest to pupils than the great world of nature, and that teachers may be able to present this subject in a comprehensive way we have arranged this series of lessons. There is no other means of giving pupils so much useful knowledge as to guide them through nature's storehouse.

As directed in your course of study, correlate the various subjects with nature study so that each may help to a proper understanding and appreciation of the other. Do not fail to make every lesson a lesson in LANGUAGE, a lesson in SPELLING, a lesson in PENMANSHIP, and incidentally connect the NUMBER WORK and READING WORK with it all.

MINERALS.

Iron—Discovery, where found, kinds, composition, uses, history, iron-working.
Lead—Production in United States, uses, manner of preparing.
Coal—Classify, anthracite, bituminous, cannel, uses, where found, coke.
Copper—Early uses, nature of, many uses, where found, quantity used.
Gold—Uses: (a) necessities, (b) luxuries; gold beating, gold mining, quartz.
Silver—Five kinds, uses, smelting, eliquation of, amount produced.
Aluminum—Discovery, process of making, nature of, uses.
General topics—Blast furnace, assaying, amalgam.

ANIMALS.

Extinct—Mammoth, mastodon, megatherium, pterodactyl.
Fabled—Chimæra, dragon, griffin, phœnix, mermaid.
Domestic—Camel, dog, cat, cow, horse.
Sea—Whale, seal, walrus, dolphin, coral.
Insects—Fly, mosquito, flea, ant, gnat, butterfly, beetle.
Fowls—Duck, goose, guinea, pigeon, turkey, poultry.
Birds—Jay, robin, carrier pigeon, stork, condor.
Miscellaneous—Prairie dog, frog, dodo, chameleon, monkey.

PLANTS.

Fungus—Lichens, mushrooms.
Flowers—Dahlia, geranium, phlox, hollyhock.
Vegetables—Potato, onion, radish, bean, lettuce.
Cereals—Wheat, corn, rye, oats, barley.
Fibers—Hemp, flax, cotton, jute.
Fruit—Orange, lemon, olive, palm, almond, bread fruit.
Forest trees—Pine, mahogany, rosewood, cinchona.
Miscellaneous—Bamboo, tea, coffee, seeds, weeds.

MISCELLANEOUS. (Classify.)

Termites, infusoria, oyster, cork, salmon, orchid, mica, mimicry, mineral work.

Birds

- BIRDS
  - General Description.....
    - Frame
    - Covering
    - Flight
    - Endurance
    - Sight
    - Song
    - Usefulness
  - Classification.....
    - 1. Birds of Prey ..
      - Eagle
      - Hawk
      - Owl
    - 2. Perchers .....
      - Canary
      - Robin
      - Wren
    - 3. Climbers .....
      - Parrot
      - Woodpecker
    - 4. Scratchers .....
      - Fowl
      - Pheasant
      - Pigeon
    - 5. Runners .....
      - Ostrich
      - Emu
    - 6. Waders .....
      - Snipe
      - Sandpiper
      - Crane
    - 7. Swimmers.....
      - Duck
      - Goose
      - Gulls
  - Subjects relating to birds ..
    - Eggs .....
      - Size
      - Color
      - Shape
    - Nests.....
      - Shape
      - Materials
    - Feathers ....
      - Quills
      - Plumes
    - Food .....
      - Bugs
      - Insects
      - Worms, etc.
      - Grains
    - Migration ...
      - 1
      - 2

A GREEDY BIRD.

The condor, the great vulture of the Andes of South America, has a voracity so great that it often gorges itself to such an extent that it cannot fly. It has been known to eat eighteen pounds of meat in a day.

LAUGHING BIRDS.

In the Zoölogical Garden of Melbourne, Australia, are strange-looking birds resembling small owls with donkey-like faces. These birds are called laughing jackasses. They perch together in rows and look as if they were very much amused over something. Presently one of them says "Ha," which is repeated by the others until the entire row seems perfectly convulsed with laughter, and people standing by laugh with the birds until the tears run down their cheeks, and they are doubled up by their paroxysms. These birds will not laugh to order. Sometimes they refuse to laugh at all for an entire day.

—*Morton.*

TEST QUESTIONS ON BIRDS.

Have birds any teeth? Any ears? How is their food digested?

Are some birds provided with a complete suit of feathers when hatched?

Name three striking characteristics distinguishing birds from other animals?

Flying at the rate of 50 miles an hour how long would it take a duck to travel from Lake Superior to the Gulf of Mexico?

Can the birds that flit from bush to bush cover long distances in a single flight?

Why do some of the bones contain air cavities?

Is there anything unsual about their sense of sight?

Why does not the perching bird fall when asleep?

Do birds return to the same neighborhood and frequently to the same nest, year after year?

Can the female sing?

Are the best singers the large, brilliant birds, or the small, lively ones?

How do birds greatly benefit the farmer and fruit grower?

Name 20 species common to your neighborhood?

NESTS.

What bird uses the nest of another in which to lay its eggs? Is this imposition resented and how?

Are some eggs laid and hatched by the heat of the sun or vegetable matter surrounding them?

Will the wild turkey leave its nest before the eggs have been skilfully covered?

What bird lives in the home of the prairie dog?

What is peculiar about the kingfisher's nests?

Describe them?

How do the tailor birds make their nest and why called "tailor birds"?

What materials do the birds in your neighborhood use in the building of their nests?

EGGS.

How does the young chick get air while and before hatching?

Why are some eggs round?

In what kind of nests are such eggs laid?

Which end of an egg is the more highly colored?

What is the shape of eggs, such as the hen's, laid on the ground? How does its shape protect it from blowing away?

Where are the eggs of sea birds gathered and used for food?

Ask your family doctor which contains the greater amount of nourishment, an egg or a pound of steak?

Eagle

"The King of Birds."

- Classification.
  - Golden Eagle.
    - Where found?
    - Size.
    - Appearance.
  - Bald Eagle.
    - Home.
    - Characteristics.
    - Description.
  - Harpy.
    - Where found?
    - Plumage.
    - Strength.
    - Fierceness.
  - Lammergeier.
    - Characteristics.
    - Home.
    - Appearance.
- Description.
  - Head.
    - Appearance.
    - Eyes.
  - Bill.
    - Shape.
    - Strength.
    - Length.
  - Wings.
    - Size.
    - Strength.
    - Color.
  - Feet.
    - Number of toes.
    - Use.
    - Strength.
- Characteristics.
  - Great flight.
  - Thievishness.
  - Birds of prey.
- Nests.
  - Mountain tops.
  - High trees
  - Cliffs.
- Food.
  - Capture.
  - Small animals.
  - Fish.
  - Dead meat.
- History.
  - Military Emblems.
    - Persian Spears.
    - Roman Standard.
    - United States.
    - Russia.
    - France.
    - Prussia.
    - Austria.
  - Legendary.
    - Messenger of Jove.
  - Symbol of—
    - Fortitude.
    - Power.
    - Courage.
    - Nobility.

QUESTIONS ON EAGLES.

For what does the eagle stand?

How did the ancient Greeks regard the eagle?

What countries now use it as a national ensign?

Are the eagle's habits as noble as its appearance?

What eagle is the national emblem of the U. S.? When was it adopted?

What trait is peculiar to the Bald eagle?

Describe the Golden eagle. In what countries is it found?

On what does the eagle live?

What eagle is noted for its size and fierceness? For what are its feathers used?

In what countries is the Lammergeier found? On what does it live?

What is the value of a gold eagle of the U. S.? When was the first one coined?

When did the eagle first appear as a military standard?

When was it adopted by the Romans?

How is the eagle of Russia distinguished from that of the U. S.?

Robin

- European.
  - Size.
  - Habits.
  - Song.
  - Where found?
- American.
  - Size.
  - Sociability.
  - Song.
- Description.
  - How classified?
  - Appearance.
  - Plumage.
  - Special Feature.
- Food.
  - Worms.
  - Insects.
  - Cherries.
  - Small Fruit.
- Nests.
  - Where found?
  - Strength.
  - Size.
  - Structure.
- Eggs.
  - Number.
  - Size.
  - Color.

QUESTIONS.

Have robins any teeth? How do they handle their food?

How does the robin breathe?

What is a popular name for this bird? Why is it appropriate?

To what class of birds does the robin belong?

What is peculiar about the formation of the muscles in the legs of perching birds? Of what use is this?

When does the robin first appear in the spring?

Name two ways in which the American and European robins differ.

What characteristics make this bird a favorite?

What class of people do not favor the robin? Why?

When do the robins migrate? Why do they do this?

How many eggs are usually laid? What is their general appearance and shape?

Parrots

- Species.
  - Number.
- Description.
  - Bills.
    - Shape.
    - Uses.
  - Tongues.
    - Description.
    - Peculiarity.
  - Plumage.
    - Wings.
    - Tail.
    - Colors.
  - Legs.
    - Strength.
    - Shape.
  - Toes.
    - Number.
    - Arrangement.
- Habitation.
  - Countries.
  - Nests.
- Food.
  - Fruits.
  - Seeds.
  - Roots.
  - Insects.
  - Honey.
- Kinds.
  - Green Parrot.
    - Where found?
    - Appearance.
    - Favorite pet.
    - Accomplishment.
  - Love-bird.
    - Size.
    - Description.
    - Peculiarity.
    - Where found?
  - Macaw.
    - Size.
    - Plumage.

Characteristics.
Where found?
Cockatoo.
Homes.
Plumage.
Crests.
Easily tamed.
Parakeets.
Size.
Feathers.
Colors.
Intelligent.
Where found?
Lory.
Kinds.
Tongue.
Plumage.

QUESTIONS ON PARROTS.

How many species of parrots are found?
Name the six most important classes.
How does the tongue of a parrot differ from that of other birds?
What three things assist the parrot in climbing?
Where is their favorite meeting place?
On what do they live?
What particular species is the most popular in the U. S. for pets? Why?
For what are love-birds noted?
In what countries are Parakeets found? When did they find their way into the U. S.?
What are the characteristics of the Macaws? For what are they prized?
What is peculiar about the tongue of a Lory? How is it useful?
In what way do Cockatoos differ from other parrots? Where is their home?

Pigeon

Species.
Number.
Classification.
Wild.
Gouras.
Passenger.
Mourning Doves.
Turtledoves.
Domestic.
Fantail.
Carrier.
Homing.
Pouter.
Jacobin.
Tumbler.
Description.
Size.
Color.
How distinguished?
Characteristics.
Flight.
Speed.
Endurance.
Instinct.
Nests.
Structure.
Size.
Where built?
Eggs.
History.
Where found?
Numbers.
Usefulness.
Extermination.

QUESTIONS.

Into what two classes are pigeons divided?
What is the difference in appearance between the pigeons found in temperate climates and those found in the tropical climates?
Where is the largest species of wild pigeon found? Describe their plumage.
Name two classes of wild pigeons found in the United States.
Tell what you can of the passenger pigeon.
Name two characteristics of turtledoves.
Name four species of domestic pigeons and tell why their names are appropriate.

Describe the carrier pigeon. For what has it been used?

What is a peculiarity of the homing pigeon? How far can it fly without stopping?

What are young pigeons called? For what are they used?

What is the character of pigeons' nests? How many eggs are usually hatched at one time?

Ostrich

DESCRIPTION.
- Size
- Height
- Weight
- Feathers
  - (a) Of male
  - (b) Of female
- Head
- Eyes
- Beak
- Wings
- Color
  - (a) Of male
  - (b) Of female
  - (c) Of chicks

CHARACTERISTICS.
- Food
- Wild state
- Domesticated
- Speed
- Eggs
  - (a) Where laid
  - (b) How hatched
  - (c) Number

OSTRICH FARMS.
- California
- Arizona
- South Africa

TEST QUESTIONS ON OSTRICH.

How does the weight and height of a full-grown ostrich compare with the weight and height of an average-sized man?

Of what country is the ostrich a native?

Are the wings of any use to the bird?

How fast can the ostrich run? Could it outrun a fleet horse?

What is the color of the feathers of the male? Female?

How are the eggs hatched in warm countries?

Does the male aid in hatching the eggs?

At what age do the birds attain their full growth?

Crane

SPECIES.
- Waders.

CLASSIFICATION.
- Whooping.
- Sand-Bill.
- Demoiselle
- Sacred.

DESCRIPTION.
- Size.
- Structure.
  - Neck.
  - Legs.
  - Windpipe.
  - Feathers.

HOMES.
- Countries.
  - Japan.
  - India.
  - Central Asia.
  - Africa.
  - United States.

NESTS.
- Bushes.
- Marshes.

EGGS.
- Number.
- Appearance.

HABITS.
- Migration.
- Feeding Time.
- Dozing.
- Peculiar Position.

CHARACTERISTICS.
- Domestication.
- Peculiar Dances.

Courtships.
Graceful Antics.

FOOD.
Vegetable matter.
Insects.
Worms
Frogs.
Reptiles.
Small Fish.

QUESTIONS.

Name two ways in which the Crane is remarkable.

In what countries is it regarded as sacred?

For what is the Demoiselle Crane noted? In what countries is it found?

How many species are found in the United States? Which is the largest and most important?

Why is the Whooping Crane so called? Describe the construction of its windpipe.

What is peculiar about the antics of this bird? At what time is it most noticeable?

In what kind of land are these birds usually found? Why is this land particularly suited to the Crane?

Where do the Cranes spend their summers? Where do they go in the fall?

What is peculiar about the way they spend the day? Describe their position when dozing.

What country gives the Crane a prominent place in its art?

Ducks

WILD.
Mallard.
Distinctive appearance.
Original of Domestic Duck.
Plumage.
Tail feathers.
Canvasback.
Where found?
Value.
Appearance.
Shoveler.
Formation of bill.
Feeding place.
Appearance.
Gadwall.
Size.
Where found?
Appearance.
Value.
Woodduck.
Beauty.
Migration.
Eider Duck.
Size.
Appearance.
Value.
Habits.

DOMESTIC.
Favorite Kinds.
Normandy.
Picardy.
Aylesbury.
Musk Duck.
Size.
Comparative.
Largest variety.
Appearance.
Variety.
Plumage.
Tail feathers.
Formation of feet.
Characteristics
Habits.
Of young.
Food.
Animal.
Vegetable.
Use.
Food.
Feathers.
Down.

QUESTIONS.

Into what two classes are ducks divided? Why are they so named?

From what did the domestic duck originate? How does its plumage differ from that of the wild duck?

How does the plumage of the Mallard differ from that of the Gadwall? For what are both these ducks prized?

What varieties of domestic ducks come from France? From England?

For what are the Musk ducks noted? What is their native country?

Name six varieties of wild ducks and tell one way in which each is noted.

In what countries does the Eider duck abound? How is it protected?

How are the nests of the Eider ducks constructed? Where is the down obtained?

Name two ways in which Eider ducks are used.

How much down does the female Eider duck furnish? How much is sufficient for a bed? How many ducks will it take to furnish down sufficient for a bed?

What is unusual about the migration of the woodduck?

Describe the formation of the wings of a duck. How does this assist it in flying?

Spiders

DESCRIPTION.
- Head and chest.
  - Formation.
  - Description.
- Abdomen.
  - Glands.
  - Filaments.
    - Use.
    - Appearance.
- Legs.
  - Number.
  - Description.
- Mandibles.
  - Glands.
  - Fluid.
  - Kill prey.

CHARACTERISTICS.
- Fighters.
- Runners.
- Leapers.
- Swimmers.

EGGS.
- Number.
- Where hidden.
- Where hatched.

SPECIES.
- Tropical.
- Garden.
- Water.
- Tarantulas.
- Trap Door.

HABITATION.
- Webs.
  - Shape.
  - Catch prey.
  - Serve as houses.
- Water Nests.
  - Construction.
  - How suspended.
  - Appearance.
- Underground Nests.
  - Size.
  - Shape.
  - Lining.
  - Construction

FOOD.
- Flies.
- Birds.
- Small insects.

QUESTIONS ON THE SPIDER.

Is the spider an insect or an animal?

Name five common varieties.

Describe the formation of the head and chest.

How many glands or spinnerets has a spider? For what are they used?

What name is the nest or home of the spider called? For what is it intended?

By what means does the spider kill its prey?

How does the female spider compare in size and fierceness with the male?
What tends to make her appear larger than she really is?
Describe the manner in which the spider captures its food.
Where is the home of the water spider? How is it constructed?
From what did the Trapdoor spider get its name? Of what does this trapdoor consist?
What is the shape and size of these underground nests? How are they lined?
To what country does the real tarantula belong?
What means were used to cure the bite of a tarantula?
What curious fact is known about the spider when its limbs are torn off?

Fly

- Species.
  - Number.
  - Characteristics.
  - Why hard to study?
- Description.
  - Wings.
    - Number.
    - Color.
    - Balancers.
  - Head.
    - Description.
    - Eyes.
  - Feet.
    - Formation.
    - Advantages.
- Habitation.
  - Where found?
  - Countries.
- Eggs.
  - Number.
  - Incubation.
  - Development.
- Food.
  - Kinds.
- Harmfulness.
  - Annoyance.
  - Spread disease.

QUESTIONS.

How are flies characterized?
What is peculiar about their eyes?
What makes the study of the fly difficult?
For what are the balancers used? Where are they situated?
What is the commonest species? Where is it found?
Give two reasons why the common fly is undesirable.
How does the formation of its feet aid it in climbing?
In what countries does religion prevent the people from killing flies? What is the result?
How many species of flies are said to exist?
Name four other insects which belong to the same family.
Do any flies live through the winter?
Name some of the different kinds you have seen.

SQUIRRELS.

- TREE SQUIRRELS.
  - Species.
    - Red.
    - Gray.
    - Black.
    - Flying.
    - Oriental.
  - Characteristics.
    - Bushy Tails.
    - Strong Jaws.
    - Sharp Teeth.
    - Bright Eyes.
    - Useful Forepaws.
- GROUND SQUIRRELS.
  - Species.
    - Ground.
    - Chipmunk.
    - Gopher.
    - Prairie.
    - Prairie Dogs.
    - Marmot.
  - Characteristics.
    - Short Tails.
    - Large Heads.
    - Cheek Pouches.
    - Powerful Teeth.
    - Burrows.
    - Villages.
- NESTS.
  - Hollow Trees.
  - Underground.
  - Composed of
    - Wood Fibre.
    - Leaves.
    - Moss.
  - Young.
- FOOD.
  - Where stored?
  - How eaten?
  - Vegetables.
    - Acorns.
    - Grains.
    - Seeds.
    - Nuts.
- USES.
  - Fur.
    - Size.
    - Value.
  - Food.
    - Tree Squirrels.
- HARMFULNESS.
  - Burrows underground.
  - Destroys crops.
  - Eats birds' nests.

QUESTIONS ON SQUIRRELS.

Into what groups is the squirrel family divided?
In what countries are they found? Where commonest?
What is remarkable about the structure of the flying squirrel? Describe its flight.
What effect do the changing seasons have on the color of the squirrel?
Name five species of tree squirrels found in America.
For what is the Oriental squirrel remarkable?
Of what does their food consist? How is it obtained?
Describe their manner of eating.
Of what commercial value are they?
Name six species classified under ground squirrels.
What are the characteristics of each?
Of what use are the cheek pouches?
In what way are some ground squirrels undesirable?
Name three ways in which ground and tree squirrels differ.

Rabbits

CLASSIFICATION.
- Hares.
  - American.
  - Mountain.
  - Polar.
  - Prairie.
  - Belgian.
- Rabbits.
  - Cottontail.
  - Jackrabbit.
  - Gray.
  - White.

DESCRIPTION.
- Domestic.
- Wild.
- Comparative size.
- Ears.
- Limbs.
- Color.
- Changes.

CHARACTERISTICS.
- Timidity.
- Sight.
- Hearing.
- Fleetness.
- Voice.

HABITATION.
- Where found.
- Kinds of nests.
- How distinguished.
- Young.

FOOD.
- Grass.
- Bark.
- Herbs.
- Vegetables.

USES.
- Food.
- Fur.
- Skin.

QUESTIONS.

In what way is the hare distinguished from the rabbit?
What class of hares change color in winter? Do you think this change is any protection? Why?
How is the rabbit protected from its enemies?
How does the rabbit compare in size with the hare?
What change in appearance takes place when tamed?
How do they become a menace?
Why is the jackrabbit so called?
What does the voice of a rabbit resemble? When is it heard?
What is an Albino rabbit?
In what way is the skin used? Is the fur valuable?
How does the formation of its hind legs affect its movements?
In what countries are rabbits found?
In what country did they become a pest?

Water

I. Composition.
   - Elements.
   - Proportion.

II. Source.
   - Clouds.
   - Ocean.
   - Lakes.
   - Rivers.
   - Springs.
   - Wells.

III. Forms.
   - Effect of temperature.
   - Solid.
     - Ice.
     - Snow.
     - Hail.
   - Liquid.
     - Rain.
     - Dew.
   - Vapor.
   - Steam.

IV. Kinds.
   - Rainwater.
   - Hard.
   - Soft.
   - Distilled.
   - Mineral.
   - Salt.

V. Properties.
   - Density.
   - Solvency.
   - Gravity.
   - Purity.
   - Weight.
   - Expansion.

VI. Characteristics.
   - Color.
   - Taste.
   - Odor.
   - Refraction.
   - Conduction.

VII. Uses.
   - Drinking.
   - Cooking.
   - Bathing.
   - Cleaning.
   - Transportation.
   - Operates machinery.

QUESTIONS

Of what is water composed? How is its formula written?

What change takes place in its color when viewed in mass?

What do you know of its powers of conduction and refraction?

At what temperature does water take the solid form? Liquid? Vapor or steam?

For what is water considered the unit? Why?

What is the weight of a cubic inch of water? When is it at its greatest density?

What is peculiar about the expansion of water?

On what property depends the universal use of water? What is a consequence?

Why is soft water so called? Hard? For what is each especially adapted?

How is pure water obtained?

What are the great natural reservoirs?

Describe the process by which moisture is gathered by the clouds. What does this result in?

What two things are absolutely necessary to human life?

Why should care be taken to keep water pure?

Outline on Coffee

COFFEE
- Appearance of plant
  - Leaves
    - Surface
    - Color
  - Blossoms
    - Fragrance
    - Color
    - Shape
  - Fruit
    - Size
    - Color
    - Cells
- Cultivation
  - Countries
    - Ceylon
    - Java
    - Brazil
    - Mexico
    - Central America
    - West Indies
    - Arabia
  - Conditions
    - Heat
    - Moisture
    - Shade

TEST QUESTIONS ON COFFEE.

What is the height of the coffee tree? How would it compare in size with the plum tree?

What is the average number of pounds of coffee per tree from each crop?

What country supplies two-thirds of all the coffee used?

Where does the best coffee come from and what is it called?

Describe the leaves, the blossoms, the fruit?

How are the berries gathered? How dried? How is the husk removed? How is coffee packed for shipment?

Of what countries is it a native?

Who were the first people to extend the cultivation to other countries?

What conditions are necessary to the growth of the plants?

Why is great skill and attention necessary in the roasting?

From what country does the United States get most of her coffee?

What is the color of the berry before roasted?

How many trees, with coffee selling at wholesale at ten cents per pound, would it require to make the same amount of money as derived from an apple tree producing ten bushels of apples valued at twenty-five cents per bushel?

Tea

I. DESCRIPTION.

1. Shrub.
   a. Height.
      When native.
      When cultivated.
2. Leaves. (See color plate.)
   a. Color.
   b. Size.
3. Flowers. (See color plate.)

II. Cultivation.
1. Where grown?
2. How many crops yearly?
3. Harvesting leaves.
a. Picking.
b. Drying.
c. Rolling.
d. Packing.

III. Grades.
1. Green tea. How prepared?
2. Black tea. How prepared?
3. Cheap grades. How prepared?
4. Commercial brands.

IV. Food Values.
1. Beverage.
a. What effect on system?
2. Extent of use.

V. Use as an Antidote.

QUESTIONS.

Why is the shrub under cultivation made to branch freely?
What part of the shrub is of commercial value?
How are green and black teas prepared?
Which of the annual harvests yields the best grade?
In what countries is tea cultivated?
May all grades and varieties of teas be prepared from the same plant?
Examine a tea leaf after steeping and compare it with those in the plate shown. Examine a number after steeping and compare them in size with each other.
In what kind of cases is tea packed? Why?
Look at the color plate and point out the parts of the plant.
What is the effect of excessive tea drinking? Is it beneficial in mild quantities? Why? Is it a stimulant?
How are some grades of green tea given their color?
Name some of the brands of tea sold in your town.

Sponge

I. Description.
1. Animal.
a. Resembles what substance?
b. Sponge of commerce. What?
c. Tubes or openings.
Use?
How located?
Number?
Extend where?
Lined with what?
d. Stomachs. What? Where?
e. Food. What? How obtained?
f. Appearance.
Glass-like. Why?
Glass-rope. Why called?
Venus Flower Basket. Why?

II. Species.

III. Properties—Sponge of commerce.
1. Light.
2. Tough.
3. Elastic.
4. Porous.
5. Absorbent.
6. Soft.

IV. Home.
1. Mediterranean Sea.
2. Red Sea.
3. How far below surface?

V. Means of Securing.
1. Diving.
a. Ancient.
b. Recent.

2. Spears and prongs.
    a. Method of seeing below water.

VI. Preparation for Market.
1. Decomposition of what?
2. Cleaned.
    a. Beaten. Why?
3. Dried.
4. Markets. Where sent?

VII. Uses.
1. Bathing.
2. Hospital.
3. Medical.
4. Domestic.

QUESTIONS—SPONGE.

What part of the sponge produces the egg?
What do we mean by a marine animal?
Do sponges attach themselves to a support?
What purpose do the openings serve?
Of what aid to the sponge are the currents of water?
Does any one tube extend entirely through the body?
By your own experimenting, prove that a sponge is light, tough, elastic, porous, absorbent, soft, etc.
Why may sponges become a source of disease? What is the danger in cheap sponges?
What is known as the fresh-water sponge? What are its habits?
Give in detail the methods of gathering sponges.
To what order of animals do sponges belong?
What are the general characteristics of this order?
What other animals in this order? In what do they resemble the sponge?
What is the food of the sponge and how obtained?
What is their digestive apparatus?
What are the domestic uses of sponges?
Of what use are they in the medical profession?

BATS.

I. General Description.
1. Size.
2. Construction of wings.
3. Skin.
4. Eyes.
5. Nocturnal animal.
6. Habits.
7. Food.
8. Home.

II. Classes.
1. Flesh-eating—Vampire bats and common kinds.
2. Fruit-eating.
3. Species—brown, heavy, big-eared, leaf-nosed.

III. Where Found.

QUESTIONS.

What kinds are common to your vicinity? Where do they live? What do they eat?
Where and how do bats hibernate?

Where are the flesh-eating bats found? The fruit-eating?
What enables them to fly?
Where do they stay during the day?
Of what use are bats?
Why do bats hang in clusters, head downward, during their long winter sleep?
Correlated subjects: Fox bat, vampire bat, and all common kinds.

Fish and Fisheries

GENERAL DESCRIPTION.
- Heart
- Blood
- Gills
- Fins
- Scales
- Eyes
- Vertebræ
- Bladder or sound
- Coloring
  - (a) Deep sea
  - (b) Fresh water
  - (c) Breeding season
- Eggs
  - (a) Where laid
  - (b) How cared for
  - (c) Number
  - (d) Young

FISHING INDUSTRIES.
- United States
- Great Britain
- Canada

SALT WATER.
- Shellfish
- Seals
- Corals
- Pearls
- Whales
- Turtles
- Sponges

FISH PROPER.
- Cod
- Herring
- Halibut
- Mackerel
- Haddock, etc.

FRESH WATER.
- Salmon
- Trout
- Whitefish
- Sturgeon
- Eel
- Pickerel
- Bass, etc.

FISHING DEVICES.
- Drawnets
- Stake-nets
- Hooks
- Harpoons

TEST QUESTIONS.

Have fish any ears? Any heart? How do they breathe?
Is their blood warm or cold?
What salt-water fish is able to swallow other fish though twice its own size?
Where are the highly colored fish found? At what season do these colors increase in brilliancy and beauty?
How many kinds of fish are known to exist now? How many kinds are extinct?
How do deep-sea fish compare in characteristics with fresh-water fish?
Where are flying-fish found, and why their name?
Where are the largest salmon fisheries in the United States? What is the average weight of the salmon?
How and for what great distances are fresh fish transported?
Where are the richest fishing grounds in the world?
What is the most important fish taken from the Atlantic? From the Great Lakes? From the Pacific?
What salt-water fish are supplied at your market? What fresh-water fish? Name three of each kind.
Name five species found in the waters of your own neighborhood.
Why have governments been careful to protect and encourage fisheries?
Tell how the government restocks certain lakes.
In what country is fishing the most important industry? Why your answer?
What remarkable size is attained by certain sharks?

Ants

Habits.	Communities.
1.	Males
2.	Females
3.	Workers
4.	Special workers or soldiers

Food.	Homes.
Animal Food	Ant-hills
Grains	Nests
Honey—dew	Tree trunks
Parasites	

TEST QUESTIONS ON ANTS.

Does the male ant do any work?
What are the household duties of the female?
What is done with the larvæ on warm days?
Do ants tunnel under rivers and build bridges?
Of what does each community of ants consist?
Which members are wingless?
What are some of the duties of the workers?
Why are some of the workers known as soldiers?
Where and how do most American ants build their nests?
Do they require food in winter?
Why do ants sometimes herd lice on plants?
How do they draw the sweet fluid from these parasites?
What are some of their acts which show wonderful intelligence?
How do some species dispose of their dead?
Why is the *umbrella* ant so called?
How does the *honey* ant come by its name?
Name some of the peculiarities you have noticed in your observation of ants.
What are white ants?
Proportionately, how much stronger would you say ants were than some of the large animals like the bear, the elephant?

ARMIES OF ANTS.

The bashikouay ants march through the forests of Central Africa in armies, often several miles in length. Along the lines are officers, who keep the army in order. If they come to a place where there are no trees they build underground tunnels, for they cannot bear the heat of the sun. When they are hungry they devour everything that comes in their way, large animals as well as small, and the negroes run for their lives. They will not touch vegetable matter, but vermin is destroyed instantly. All the insect world flies before an army of this kind.

When these ants want to cross a stream they form a living bridge with their own bodies over the water. This is done by a great number of ants, each clinging with his fore-claws to his next neighbor's body. Over this living bridge the whole army of ants march in order.

—*Morton.*

CLASSES.
Solitary.
(a) Mason-bee
(b) Carpenter-bee
Colony or Society.
(a) Honey-bee
(b) Bumble-bee
Eggs.
Size
Color
Shape
Where deposited
(a) For workers
(b) For drones
(c) For queens
Time for hatching

SPECIES.
Honeybee
Bumblebee

Swarm.
Number
Queen
Drones
Workers

Habits.
Flight
Honey gathering
Forming new swarms

TEST QUESTIONS.

What is a worker? A drone? A queen?
Could clover be successfully raised without the aid of bees? Why not?
How many queens are there in each swarm?
How many eggs does she lay in a single day?
What distinction is made between the eggs that give birth to *workers* and those that give birth to the *drones?*
Are the eggs which are to develop into queens laid in cells differing from the others?
On what is the queen fed?
Why are the drones so called?
How do the workers compare in numbers with other classes in the swarm?
In how many days do the eggs hatch?
How long and by what class are the larvæ fed?
When do the workers seal the larva up in the cell?
How long before it comes forth a bee?
When is a new queen allowed to appear in the swarm?
What becomes of the old queen?
What do the bees do in the winter?

Food of bees:
What is it?
How obtained?
How stored?

Enemies of the bee:
1.
2.
3.
4. Name them.

What plants furnish the most desirable honey?

AN ENEMY OF THE BEE.

A remarkable bird found in Mexico is the bee martin, which has a trick of ruffling up the feathers on the top of its head into the exact semblance of a beautiful flower, and when a bee comes along to sip honey from the supposed flower it is snapped up by the bird.

QUESTIONS.

How long is the alligator when fifteen years old? When full grown?

Were you born the same year with an alligator and lived to be 100 years old, what stage of growth would the reptile then have reached? Does the alligator outlive the elephant? The whale? The turtle? The camel?

How many dozen eggs are laid by the female? When and how are these hatched?

What animal does the alligator resemble?

Do alligators hibernate?

What is the disposition of the alligator?

Where do they eat their prey?

What is alligator leather used for?

Cork

TREE.

From what species of trees is cork obtained?

In what countries does it grow?

How old must the tree be before it produces?

BARK.

What part of the tree yields the cork?

Is the first stripping the best quality?

How many years does it take the tree to grow a new bark?

Is it the outer or the inner bark that produces the cork?

What is the thickness of this bark?

How is it removed from the tree?

USES.

What are some of the qualities of cork?

Why is it especially serviceable for the stopping of leaks in vessels?

In what other ways is it used?

CUTTING.

How many grades of cork are there?

What is done with cork to prevent its taking the temper out of knives that slice it up?

How many hundred times a minute does the disc-shaped knife revolve?

How many thousand corks can be cut a day?

How are the corks sorted for shipment?

Birch

VARIETIES.

Cherry birch
Black birch
Yellow birch
Paper birch
Dwarf birch

USES.

Timber
Furniture
Fish casks
Hoops
Wooden shoes
Paper
Canoes
Boxes

QUESTIONS.

What furniture have you, made from birch?

In what continents does the birch tree grow?

Describe its wood. Its bark.

What are some of the uses of the bark?

Why are fishing nets and sails steeped with it?

How is the oil used in Russia?
What can be made from the sap?
What variety furnished the bark from which Indians made their canoes?

Orange

Distribution.	Tree.	Fruit.	Harvest.
Asia	Height	Shape	Picked
Europe	Branches	Color	How
Africa	Leaves	Kinds	When
Australia	Flowers	Navels	Sorted
United States	Color	Blood orange	Packed
Florida	Fragrance	Russets	Shipped
California.	Shape	Mandarin	

TEST QUESTIONS.

What was the kind of orange you ate for breakfast? Where was it raised—in California or Florida? How can you tell?

How many kinds are kept at your grocer's store or nearest fruit stand?

Looking at the color illustration, what do you see remarkable about it?

Is it true of the apple to see ripe fruit and blossoms at the same time?

Why does the navel orange recommend itself to the consumer?

Of what country is the orange a native?

From what South American country was the orange introduced into California?

What is the height of the cultivated tree?

Name three of the most common varieties. Describe each in detail. Which is in the greatest demand in the United States?

Why is the blood orange so called? What is a mandarin?

Why are orange blossoms so popular with brides on their wedding day?

How many million trees are found in California? Florida?

How are oranges harvested, packed, and shipped to market?

What can you say of the orange as to food value?

Apple

Tree.
1. Height.
2. Bark.
3. Branches.

Leaves.
1. Shape.
2. Color.
3. Size.

Blossoms.
1. Color.
2. Fragrance.
3. Size.
4. Shoots.

Uses.
1.
2.
3.
4.

Fruit.
1. Size.
2. Shape.
3. Color.
4. Skin.
5. Pulp.
6. Core.
7. Seeds.
8. Cells.

Varieties.
1. Known in United States.
2. Number profitable.
3. Successful in any one locality.

Seedless and Coreless Apple.
1. Color.
2. Flavor.
3. Size.
4. Appearance.
5. Blossomless tree.

QUESTIONS ON THE APPLE.

To what family does the apple tree belong?

Of what continent is it a native?

What people introduced the apple into England? Into the United States?

What continent now leads in its production?

How many barrels will one tree yield in a season under favorable conditions?

From what two species have the two varieties been derived?

How many cultivated varieties of apples are known?

How many cultivated varieties are grown in the United States?

How many of these are profitable?

How many varieties are successful in any one locality?

Do the seeds produce the fruit from which they are taken?

How is vinegar made from apples?

Name five varieties found in your orchard or in the grocer's store?

How are orchard trees prepared?

What is grafting?

What states have the largest number of trees? What states produce the largest quantity of fruit?

Why is clover sown in an orchard to insure a good crop?

How many apple trees are there in the United States? How many barrels does the yearly crop amount to?

Who has succeeded in growing the seedless and coreless variety of apples?

What is peculiar about the skin of these apples?

Why is the blossomless tree an important feature of this variety?

What danger is removed by the lack of the flower?

What are the indications that the seedless apple will in time displace all the old seed-bearing varieties?

Peach

TREE.	FRUIT.	FAVORABLE CONDITIONS.
Size.	Classes.	Sandy soil.
Shape.	Size.	Sun.
Height.	Shape.	Warm temperate climate.
BLOSSOMS.	Color.	HARVESTING.
Color.	Skin.	Picking.
Shape.	Stone.	Packing.
Form.	DISTRIBUTION.	Shipping.
LEAVES.	In U. S.	
Size.	In states.	
Shape.	Amount raised.	
Color.		

QUESTIONS ON PEACH.

To what fruits is the peach allied?

In what country is it most extensively cultivated? In what climate does it thrive?

What sections of the United States are best adapted to its cultivation?

Is any other fruit raised more abundantly in this country?

Into what classes are peaches divided? What characterizes each class?

Describe some of the different kinds of peaches you have seen or eaten.

In what ways is this fruit used?

Name the peach growing states in the United States. What state grows the largest quantity?

Where are ostrich farms established in the United States?
For what purpose are these farms established?
What is the value of ostrich feathers? Why are they so greatly prized?

Dogs

I. Description.
   1. Size.
   2. Structure.
   3. Appearance.
   4. Characteristics.

II. Uses.
   1. Hunting.
   2. Protection.
   3. Commercial purposes.
      a. Leather.
      b. Miscellaneous.
   4. Transportation.

III. Classification.
   1. Wolf Dogs.
      a. Newfoundland.
      b. Eskimo.
      c. St. Bernard.
      d. Shepherd.
   2. Watch Dogs.
      a. German boarhound.
      b. Danish dog.
      c. Matin dog.
   3. Greyhounds.
      a. Scotch.
      b. Italian.
      c. Irish.
      d. Turkish.
      e. Russian.
   4. Hounds.
      a. Bloodhounds.
      b. Foxhound.
      c. Staghound.
      d. Setter.
      e. Pointer.
      f. Spaniel.
      g. Poodle, etc.
   5. Cur Dogs.
      a. Fox terrier.
      b. Skye terrier.
      c. Scotch terrier, etc.
   6. Mastiffs.
      a. Bulldog.
      b. Pug-dog, etc.

QUESTIONS.

Where are wild dogs found?
Why are bloodhounds so named?
What remarkable intelligence is displayed by the collie?
What other animals are included in the type to which the dog belongs?
How do dogs compare with other animals in affection and intelligence?
Which family of dogs furnishes the largest specimen? What is its weight?
From what does the St. Bernard derive its name?
What use did the monks of St. Bernard make of the dog?
How was the Newfoundland dog made use of in his native land? What are some of his strong points? Why does he make a good watch dog?
What great English painter used the Newfoundland dog as a subject for one of his famous paintings? (which see.)
Which is the most celebrated of all strains of shepherd dogs? What points show that it is adapted to outdoor life? Of what assistance is it to the shepherd?
What is the size and build of the Eskimo dog? Of what use is it in the Arctic regions? How many miles a day can it travel?
What is the most distinguishing feature of the greyhound? Has the name any reference to its color? From what is the name derived?
What special sense marks the difference between the hound and the greyhound?
Which shows the most affection for man, the smooth-haired or the rough haired variety?

Silk

I. Silk Moth.
   1. Description.
      a. Body.
      b. Legs.
      c. Wings.
      d. Number of eggs.

II. Silk Worms. (Wild.)

III. Silk Worms. (Culture.)
   1. Eggs.
      a. Number.
      b. Deposited when?
      c. Temperature for hatching.
      d. Time of incubation.
   2. Caterpillars.
      a. Early appearance.
      b. Care.
      c. Food.
      d. Development.
      e. Casting size.
      f. Body.
         Segments.
         Legs.
      g. Mouth.
      h. Color.
   3. Cocoon Development.
      a. Racks.
      b. Tubular glands.
      c. Spinneret.
      d. Time.
      e. Length of thread.
      f. Hatching.
         Time required.
         Prevention of.
      g. Proportionate weight in silk.
   4. Origin of Industry.

IV. Manufacture.
   1. Unwinding cocoons.
   2. Reeling silk.
      a. Description of process.
   3. Raw Silk.
      a. Why and when washed?
      b. How wound?
      c. How assorted?
   4. Throwing—Necessary before weaving.
      a. Spinning, twisting, reeling.
      b. Usually done by machinery.
      c. Regulation of twist.
      d. Single.
      e. Sewing silk.
   5. Doubling.
      a. Tram silk.
      b. Threads twisted in one direction.
   6. Organzine.
      a. Threads twisted in opposite directions
      b. Hard silk.
   7. Weaving.
      a. Modes.
      b. Peculiarities.
      c. Intricacies.
   8. Waste Silk.
      a. Consists of what?
      b. Processes.
      c. Use.

V. Countries.
   1. Raw Silk.
      a. China, Japan, Italy, France.
   2. Manufactured Silk.
      a. France, Germany, Switzerland, United States.

VI. Colored Plate.

VII. Artificial Silk.
   1. Composition.
   2. How produced.
   3. Value.
   4. How extensively used?

QUESTIONS.

Turn to the color illustration and follow the development of this useful insect through its life. What do you see remarkable about some cocoons?

Give three reasons why silk is more expensive than cotton.

Name five materials made from silk in your home.

What people originated the silk industry? Are the people of this country still engaged in it?

What is the length of thread furnished by a cocoon? For what part of a mile would it stretch?

Why are not the cocoons intended for silk permitted to hatch? How is this prevented?

How many pounds of cocoons are required to yield one pound of raw silk? How many pounds of cocoons will an ounce of silk worms' eggs produce?

How are the eggs hatched artificially? What temperature is necessary? What is the time required? What is the food given and how prepared?

During the caterpillar stage of eight weeks how many times does the worm cast its skin?

How many legs has the caterpillar? With what are some provided?

When does the caterpillar become lazy and refuse to eat? When does it begin to spin its cocoon? How long does this take?

What are the leading silk-producing countries? Silk manufacturing?

What people have been the most ingenious in the invention of looms?

What is artificial silk? How is it made? How does it compare with natural silk in durability? In beauty?

Coral

I. Definition and Description.
II. Forms.
  1. Tree.
  2. Organ pipe coral.
  3. Brain.
  4. Reef.
    a. Where found?
    b. Construction.
    c. Characteristics.
    d. Atoll.
III. Colors.
  1. Pure white.
  2. Pink.
  3. Red.
  4. Black.
IV. Coral Fisheries.
  1. Location.
  2. Methods.
V. Commercial Value.
  1. Jewelry.
    a. Necklaces.
    b. Other ornaments.
VI. Markets.
  1. Naples.
  2. Genoa.

QUESTIONS.

What enables the coral insect to cling to the rock and draw food into its stomach?

What part of the insect becomes a contribution to the coral formation?

What is coral? What is a polyp?

Why is the tree coral so called? How is it formed?

Describe the organ pipe coral.

Which species of coral is most widely distributed?

What is interesting about the brain coral?

Which varieties are prized for jewelry?

Where are these varieties found?

Off what coasts are coral fisheries maintained?

What two cities are the chief centers of the coral industries?

What determines the value of coral?

Why is it that the coral polyp never builds to the surface of the water?

How are the upper portions of the reef built up?

Why do coral reefs take a circular form?

How do we know that the coral polyps have been working for many ages?

Correlated subjects: Coral Fish. Coral Sea. Coral Tree. Atoll.

Elephant

I. Description.
   1. Size.
      a. Height.
      b. Weight.
   2. Physical Construction.
      a. Limbs.
      b. Head, neck.
      c. Trunk.
      d. Skin.
      e. Tusks.
   3. Intelligence.
      a. Teachableness.
      b. Keen memory.
   4. Disposition.
      a. Timid.
      b. Obedient.
      c. Patient.

II. Species.
   1. Asiatic.
   2. African.

III. Habits.
   1. Lives how? Where?
   2. Rarely bred in domesticity.
   3. Great swimmer — delights in water.
   4. Food.

IV. Domestication of the Elephant.
   1. Plan of capture.
   2. Methods of training.

V. Uses.
   1. Beast of burden.
   2. War.

VI. Value.
   1. Commercial.
      a. Ivory.
      b. Menageries.
      c. Training.

QUESTIONS ON ELEPHANT.

How does the elephant compare in size with other animals?

How does the Asiatic elephant differ from the African?

Why is the African elephant seldom seen in captivity?

What is the greatest height to which elephants attain? What is their usual height?

What is their weight? Describe the body. The legs. The toes.

What is the most remarkable feature of the elephant? What is peculiar about the skin?

What use does the elephant make of its trunk?

Why are the tusks valuable? How much do they weigh?

Is the elephant's brain large or small in proportion to the size of its body?

How does the elephant compare with other animals in intelligence?

Which ones separate themselves from the herd and live solitary lives?

Why are these called rogues?

In what ways are wild elephants caught?

How are trained elephants used in capturing wild ones?

What great warrior had with him an army of elephants when he invaded Italy?

In what country have the animals been used to the greatest extent?

What part do they take in occasions of pomp and display?

How are they of use in lumbering?

INTERESTING FACTS ABOUT THE ELEPHANT.

To give lightness to what would be otherwise an insupportable weight, the cranial bones contain numerous large air cells.

Elephant feet are considered a great delicacy by some African tribes.

I. General Description.
  1. Construction.
    a. Head.
    b. Body.
    c. Limbs.
    d. Size.
    e. Weight.
    f. Fur, etc.
  2. Habits.
    a. Home.
      Winter.
      Summer.
    b. Hibernation.
    c. Care of young, etc.
  3. Food.
  4. Disposition.

II. Species.
  1. Name seven.
    a. Characteristics.
    b. Where found.

III. Uses and Value.
  1. Food.
  2. Fur, etc.

QUESTIONS.

How does the weight of a grizzly bear compare with that of a horse? A cow? How does the grizzly differ from other kinds of bear?

With what other animals have bears many features in common?

Why does the body of the bear appear more bulky than it really is?

In what way does the bear use its claws? What is peculiar about the movement of bears? Where do they usually make their homes?

Which species live almost entirely on fish?

In what ways is the bear of commercial value?

How does the polar bear differ from all the others? Why are its feet hairy on the soles?

Which kind of bear would it be most dangerous for you to meet on a hunting trip?

How could you easily identify the spectacled bear were you traveling in the Andes? Why so called?

How could you tell a honey bear? Where are honey bears found? Why so named?

What species of bear would you find on a hunting trip into northern Michigan? Into Canada? Into the Rocky Mountain regions? Into Kadiak Island, Alaska? Into the Arctic regions?

Which species is the most widespread?

Where is the home of the barren-ground bear?

Why is the Kadiak bear so called?

CACAO TREE.

I. Where Found.
  1. Native.
  2. Cultivated.

II. Description.
  1. Tree.
  2. Fruit.
    a. Pods.
    b. Seeds.

III. Products.
  1. Cocoa.
  2. Chocolate.
  3. Cocoa Butter.

IV. Uses.
  1. Drinking purposes.
  2. Confections.
  3. Medicinal.

USES OF THE BEAR.

The natives of Kamchatka are indebted to the bear for many things which to them are the comforts of life. Beds, coverlets, bonnets and gloves are made from the skin; the flesh is used for food, as is also the fat; the intestines are used as a substitute for glass in windows and as masks for protecting the face from the glare of the sun; the shoulder blades are used for scythes to cut grass.

—*Morton.*

QUESTIONS.

By what process is the commercial chocolate made? Cocoa?
Where are these articles used largely as a beverage?
What is the commercial importance of each?
What per cent of fat do the seeds contain?
What element does chocolate contain that is lacking in cocoa?
How is cocoa butter used medicinally?
Describe the pod. How many seeds does it contain?
Give preparation of chocolate for shipment.
What is the height of the cocoa tree? What are the uses of cocoa butter?
First used in what country? What is the size of the cocoa bean?
Why are the beans roasted? How are the nibs reduced to paste?
How is the paste prepared for use?

Cocoanut

I. Where Found.
  1. Native.
  2. Cultivated.
II. Description.
  1. Tree.
    a. Name.
    b. Height.
    c. Leaves.
  2. Fruit or nuts.
    a. Size.
    b. Shape.
    c. Husk.
    d. Meat.
    e. Milk.
    f. Food.
III. Products of Nut.
  1. Oil (cocoanut butter).
    a. Soap.
    b. Candles.
  2. Cups, ladles, etc.
IV. Products of Tree.
  1. Food—bud at top of tree.
  2. Sap—wine.
  3. Leaves—to thatch cottages.
  4. Fibers—mats, cordage.
  5. Trunk—boats, timbers, etc.

QUESTIONS.

What part of the tree is made into wine? To what practical uses has the tree been put? The cocoanut?

Why is the fluid within the nut called milk? What is made from the trunks of the trees?

When do the trees begin to bear fruit? How long do they continue to produce?

For how many years does the cocoanut tree continue to bear without any attention?

How has the tree distributed itself to the tropical islands? What are some of the things made from the fiber?

What are the principal uses of the shells? The oil? The fruit? The leaves?

Cotton

I. Varieties.
  1. Long fiber or sea island cotton.
  2. Short fiber or upland cotton.

II. Where Raised.
  1. United States.
    a. Sections.
  2. Foreign Countries.
    b. Names.

III. Planting.
  1. Methods.
    a. Rows—distance apart.
    b. By what means.
  2. Season.

IV. Cultivation.
  1. Soil.
    a. Sandy loam—lime and phosphates.
    b. Heavy rainfall while planting.
  2. Dry season, to mature.
  3. Temperature.
    a. Not less than a mean annual temperature of 60 degrees.

V. Harvesting.
  1. Time.
    a. Bursting of pods or bolls.
  2. Picked by hand. All bolls not ripe at same time.
  3. Sent to gin house.
    a. Seeds removed by cotton gin.
    b. Pressed into bales of 500 lbs. each.

VI. Seaports, Raw Material.
  1. United States.
  2. Foreign.

VII. Factories.
  1. United States.
  2. Foreign Countries.

VIII. Products.
  1. Cloth.
    a. Clothing.
    b. Household furnishings.
  2. Cottonseed Oil.
  3. Fodder and Fertilizer.
    a. Seeds from which oil has been pressed ground into powder.

IX. History and Growth of Cotton Industry.
  a. Domestic.
  b. Foreign.

X. Colored Plate.

QUESTIONS.

What eight states lead in cotton production? What states make up the cotton belt?

At $50 per bale how does the cotton crop in the United States compare in value with the corn crop at 40 cents per bushel?

Which variety of cotton is most extensively cultivated in the United States?

What is the average height of the upland plant? Of the sea island?

From what does the sea island cotton take its name?

When and how are cotton seeds sown? How is cotton cultivated?

How long after the flowering has commenced until the seeds open?

How is cotton harvested? How is cotton separated from the seeds?

What is the oldest cotton-growing country? Who introduced the cotton shrub into Europe?

Where and when was cotton first planted in our country? What countries raise the world's supply?

What are our leading cotton ports?

How did the invention of the cotton gin affect the production of cotton?

Who invented the cotton gin? In what form is the cotton sent to the manufacturer?

How are cotton seeds utilized? What is the weight of a bale?

How much of the world's cotton is raised in the United States?

Name five materials made from cotton found in your home.

Frog

I. Tadpole.
  Young frog.
  1. Description.
    a. Head.
    b. Tail.
  2. Transformation.
    a. Body.
    b. Mouth.
    c. Gills.
    d. Legs.
    f. Tail.
  3. Food.
II. Mature Frog.
  1. Where found?
  2. How breathe?
  3. Movements.
    a. Water.
    b. Land.
  4. Food.
  5. Commercial value.

Toad

I. Tadpole.
  Young toad.
  1. Transformation.
    (See Frog.)
  2. Food.
II. Mature Toad.
  1. Description.
    a. Where found?
    b. Color.
    c. Warts.
    d. Species.
    e. Food.
      Kinds.
      Mode of obtaining.
    f. Movements.
    g. Uses.
      Pet.
      Destroys insects.
    h. Poisonous?

Lizard

I. Definition.
II. Description.
  1. Limbs.
  2. Body.
  3. Tail.
  4. Glands—peculiarity?
III. Species.
  1. Number?
IV. Where Found.
V. Food.
  1. Vegetable.
  2. Animal.
VI. Habits.
VII. Families.
  1. Skinks.
  2. Geckoes.
  3. Iguanas.
  4. Chameleons.
VIII. Gila Monster.

QUESTIONS.

By what means does the toad procure its food?

What is the breeding-place of the frog and toad?

How does the food of the tadpole differ from that of the mature frog? The mature toad?

How are frogs' legs regarded as a food? To what industry has this led?

Why are the toad and frog classed as amphibians?

What becomes of the tail of the tadpole?

Of the following points mention those that are common to both the toad and the frog, and those in which they differ: Home, appearance, tadpole stage, construction, breeding and food.

In what respect does the lizard resemble the frog or toad? In what respects do they differ?

What climate is adapted to the lizard?

What is their food?

Do the young resemble the mature lizard?

Why is the lizard classed among the reptiles?

How many species are there?

What is the Gila monster? Where found? Why dreaded?

A QUEER LIZARD.

In Australia is found the frilled lizard about two feet long including its tail. The loose skin about its throat, it can by some peculiarity erect to look like the broad lace collars of Queen Elizabeth's time. When frightened or startled this lizard rises on its hind legs and jumps like a kangaroo.

Butterflies

DESCRIPTION.
- Head.
  - Antennæ.
  - Eyes.
  - Tongue.
- Thorax.
- Legs.
- Wings.
  - Number.
  - Structure.
- Abdomen.

COLOR AND SIZE.
- Male.
- Female.
  - Temperate regions.
  - Tropical regions.

LIFE HISTORY.
1. Eggs.
   - How and where laid.
   - Time required for hatching.
     - In cold countries.
     - In tropical climates.
2. Caterpillar.
   - Definition.
   - Number of segments or rings.
   - Number of legs.
   - Covering of body.
   - Number of eyes.
   - Movements.
   - Food.
3. Chrysalis.
4. Insect.

CLASSIFICATION.
- Known Species.
  - In the world.
  - In United States.
  - In your neighborhood.
- American Families.
  - Brush-footed.
  - Metal marks.
  - Blues.
  - Swallowtails.
  - Skippers.
  - Coppers.
  - Hair streaks.

QUESTIONS.

What protection does nature provide the butterfly?

How many thousand kinds are known in the world? In the United States?

In what three ways do butterflies differ from moths?

Where are butterflies found whose wings measure eight inches from tip to tip?

How many legs has a butterfly? How many wings?

To what part of the body are the legs and wings attached?

On what do butterflies feed? How is their food obtained?

Name the five different families under which the North American butterflies are classed.

How do the species of the tropical countries compare with those of the temperate latitudes?

How and where are the eggs deposited? What is the period of incubation in warm countries during the summer months? In colder countries?

Do caterpillars ever eat flesh?

What is the duration of the larva stage in temperate climates? In cold regions?

In how many ways do caterpillars attach themselves to leaves?

How does the insect breathe in the pupa state?

How long does the pupa state continue?

What is the appearance of the imago when it comes out of the chrysalis?

How long before it becomes perfect and is ready for flight?

What is the best-known species of your own neighborhood? Name three.

TEST QUESTIONS ON OWL.

How were owls regarded in olden times?

What bird was sacred to Minerva and mentioned frequently in literature?

Is the owl entitled to the wisdom its look gives it?

What is characteristic of the owl's body?

To what peculiar feather formation about the eyes is due the owl's credit of wisdom?

What is peculiar about the owl's flight?

In what respect are the owl's toes similar to the human hand?

ANIMALS.

What animal has eyes on the ends of its horns, has one foot and moves very slowly?

Name a dozen different animals of your county, wild or domesticated.

How does the beaver build houses, gnaw down big trees and build dams? What feature has the beaver in common with the bee?

Where is the bandicoot rat found? How large is it? How is its flesh considered by the natives?

The cruel treatment to which the badger was once subjected gave rise to what word now in common use?

In what way is the earthworm of great help to the farmer?

What is a common practice of the fox at time of capture?

How do you pronounce "coyote?" What is its size?

Where are gorillas found? What do they eat?

Why has the dolphin been celebrated by poets?

What are anthropoid apes?

In what particular attitude do bats remain through winter?

To what uses is the buffalo put in India?

What is the average burden carried by strong camels and their rate of speed? What is the usual length of a camel's life?

Where is it supposed that cats were first domesticated?

In what country are there no deer?

When does a dog's growth cease and what is the highest limit of dog life?

What are the methods of capturing elephants, singly or in groups?

What is the height of the tallest of all animals?

What ancient people considered the hippopotamus a god?

From what comparatively small animal has the horse developed in the process of evolution?

Characteristics of what two animals are combined in the mule?

What is the general structure of the seal?

For how many centuries has whale fishing been an important industry?

What kind of ivory is preferred by dentists, and why?

Why don't the larger animals migrate instead of hibernating?

In what respects do mammals (milk-givers) differ from all other animals?

What products of a whale are of commercial value?

Give some characteristics of the rabbit. For what is it valued? In what country is it so plentiful as to be a menace?

Has the squirrel any commercial value?

Name all the common animals you know whose fur is used in the fur trade. How is it prepared and used?

What is the muskrat noted for? Where is it found?

What are the uses made of the different parts of the hog?

Why has the giraffe a small head?

From what source is angora wool obtained? What is astrakan wool?

Are coon skins used in the fur trade?

Name the uses to which all parts of the cow are put.

Which is the more useful when alive, the horse or cow? When dead?

Age of Whales—The age of whales is ascertained by the size and number of laminae of the whalebone, which increases yearly. Ages of 300 and 400 years have been assigned to whales from these indications.

BIRDS.

From what does the bobolink take its name? When does the bobolink lose his brilliant colors, become very fat and esteemed for his delicate flesh? What famous poet wrote a lyric about this bird? What is the color of its eggs? (See color plate.)

How does the albatross sleep in midocean? What happens when food is plentiful? How does it rank in regard to size?

How is the color of the canary bird brought about?

On how many national ensigns does the eagle appear?

What is remarkable about the speed of the road runner?

What are the most expensive feathers and why are they so rated?

What are the eight orders into which birds are divided?

What fossils prove an evolution of birds from reptiles?

When was the canary introduced into Europe?

What is the highest record for distance traveled by carrier pigeons recently made by an American pigeon?

From what eastern countries did all species of fowl originate?

What is the common wild goose of the United States?

How many species of humming birds are now known?

To what great age do parrots live?

What are some of the characteristics of the ostrich?

What are the birds of prey? Where is their home, and in what sense are they valuable?

What nation values the nest of the bird known as the swift as a food? Of what is it made?

What birds remain in the temperate zone all winter?

What is the cause of the migration of birds?

How do the birds of paradise get their name?

What is remarkable about the eider duck's down? What is the size of the duck? Where is it found and for what greatly prized?

FISH

How do oysters eat?

How would you distinguish an oyster from a clam? In what latitude are oyster beds found? At what age does the oyster attain its growth?

Describe the method of attack on oysters by the starfish.

Name the three varieties found in your home market.

What is the appearance of the oyster eggs?

As oysters develop what is one of their striking peculiarities?

Where would you fish for large-mouthed black bass, in lakes or streams? For the small-mouthed variety?

Where are bass caught weighing from 300 to 400 pounds?

What is peculiar of the balloon fish?

What city eats bluefish every year to the value of a quarter of a million dollars?

Where are blind fish found? How do you account for their blindness?

In what way does the archer fish capture insects several feet above the surface of the water?

How is cod fishing carried on? How many thousand hooks are put out by a single schooner?

For what unusual time can cuttle fish remain alive out of water?

Where is the greatest reservoir for the special cultivation of cod?

What three expeditions have contributed much to the knowledge concerning fish?

What effect have electrical fishes upon man?

For what is the flying fish noted?

What is the average size and weight of a salmon?

What variety of the clam has the largest shell known?

Which two countries are the chief centers of the oyster industry?

What are kitchen middens and where do they occur?

Name five kinds of fish common to the waters of your vicinity.

INSECTS.

Which does the biting, the male or female mosquito? How do mosquitoes spread disease? Describe the process in detail.

There are how many thousand species of bees?

How do ants capture other insects and use them as milch cows?

In how many remarkable ways does the beetle protect itself? Is any part of the globe free from this insect? How many thousand species are known?

What enables the fly to walk on the ceiling?

On what did the potato bug feed bofore the cultivation of this vegetable? What is its other name?

What people relished baked locusts for food?

How do grasshoppers produce their chirping noise?

During what seasons are chinch bugs most destructive? Describe their method of attacking wheat and other grains. What enormous damage do they cause yearly?

What peculiarity gives the army worm its name?

REPTILES.

To what remarkable length does the anaconda grow? Where is this snake found?

On what was it thought for a long time the chameleon lived? How does it change its color?

At what period of its existence does the frog live on its tail?

Why did the ancient Egyptians preserve the body of the alligator with the same care given the human body?

How is a rattlesnake's rattle produced?

What is the most important species of turtle? What is the weight of these? The length?

Where does the lizard lay its eggs only to abandon them?

What is the Gila monster? Where is it found? Is its bite deadly to man?

Which is the only one of the thousand species of lizard that is venomous?

What commercial value has the alligator?

To what class of animals are reptiles most closely related and how do they differ?

What part of the frog is relished as a food?

"Nature, when she adds difficulties adds brains."

—*Emerson.*

Orthography

Unless a person learns to spell when young it is almost certain that he will go through life a poor speller. Any exercise in school work that follows only a beaten course loses its life and cannot result in permanent benefit to the pupils. There is no subject that will admit of more variation than will the spelling exercise. It is true that many teachers create no special interest in this work from the simple fact that they adhere to some out-of-date method which has lost its charm.

It has been our intention in the following pages to suggest such a variety of exercises that any teacher can create an interest and maintain that interest throughout the entire term of school. So soon as one style of work becomes monotonous another field will open up to the progressive teacher and the spelling will become not only an interesting but a profitable period.

John Ruskin tells us that we must get into the habit of looking intensely at words, assuring ourselves of their meaning, syllable by syllable, nay, letter by letter, and that we must watch the accent of words closely and their meanings more closely still. Spelling is an evidence of culture and for this reason we urge the fond parent and devoted teacher to give this important subject the attention which it deserves.

The various exercises here suggested are such as can be made interesting in any grade and in any school, and to the teacher, where her work drags slowly, we suggest that she enliven the class work with some exercises out of the ordinary and away from the text book, and thus surprise herself with the rapidity with which time will move.

Tree Exercise.

A good exercise to help the child to learn to recognize forms and names associated with them is to make pictures of the objects. Draw upon the board a picture of a tree telling them it is a fruit tree and have pupils tell you names of different fruits that grow on trees. This exercise can be done on their slates or paper or different children can be called upon to come to the board.

Garden Exercise.

Draw a diagram of a flower garden and after laying out the different flower beds have pupils tell you what flowers to put in them. When giving such exercises be careful to choose objects with which the child is familiar, such as a house, a farmyard, etc.

Picture Mounting.

Cut and mount pictures of birds, animals and other familiar objects and after holding up one at a time, have pupils either tell you the names of the objects or write them on their slates.

Word Making.

One exercise, though not very new, but which the pupils find very attractive, is either to give or let the pupils choose a word from the letters of which a number of smaller words can be made and after the lists are made and collected the teacher can keep the misspelled words for review exercises.

Use in Sentences.

When new and interesting words come up in a lesson, their meaning and use will be better retained by the pupil if original sentences are made up containing one or more of the words, or if some of the most important are made the subject of a composition.

Sentence Building.

Spelling in the primary grades is principally written and phonetic and should be brought into the reading and writing lessons. A very successful plan used by some teachers is to write instead of giving their directions to the class, such as Rise, Hop, Skip, Rest, etc. As the pupils become more advanced, allow them to step to the board and write short sentences, such as "I can skip." "I can run." "I can rest," etc.

Erroneous Idea.

The idea of giving classes exercises consisting of misspelled words and incorrectly written sentences for correction, as practiced by some teachers, is in our opinion, erroneous. Unless the pupils are very far advanced such practice is injurious and tends to confuse the pupils' idea of correct spelling.

Last Letter Exercise.

Assign a day in advance a lesson on birds, fruits, vegetables or flowers and the following day call on some pupil to spell some word found under the different heads, the next pupil spelling a word commencing with the last letter of the word previously spelled. To illustrate: Suppose that birds are the subject of the lesson; one pupil spells "bobolink," the next will spell "kingfisher" and the next "robin," and so on.

Observation.

Ask the pupils what they saw on their way to school this morning and have them make out a list of ten or more things. This will stimulate the habit of observing what goes on about them. Accustom pupils to observe carefully all words as they read.

Meaningful Words.

Interesting facts, found in the different text books used, should be incorporated into the spelling lessons, giving instructive information rather than a list of meaningless words. Where lists are given of the principal cities and capitals and separate lists of the different states, the two lessons should be correlated and capitals and principal cities of a state associated with the state in which they are located.

Abbreviations.

Special lessons should be made of abbreviations and contractions and lists should be made of words and their abbreviations, explaining their use and formation. Lists of the words from which contractions are formed should be made and their use given. The proper use of the apostrophe in contractions should also be emphasized.

Classification of Words.

Classifying words as simple and compound, primitive and derivative, proper and common is an excellent foundation for the study of language. The words can be arranged in groups, first by the teacher and later by the pupils.

Proper Forms.

Rules for the use of plurals and possessives, also of the hyphen and apos-

trophe are important factors in the correct use and writing of words; and the most interesting, as well as instructive, method of presenting them is to have either dictated or original lessons written. Sometimes writing a number of sentences on the board, leaving out apostrophes and hyphens, to be filled in by the pupils, helps to vary the lessons.

Pronunciation.

Drills on syllabication and accent for pronunciation can be made interesting by preparing lists of words of two or three syllables, having pupils divide words into syllables, showing accented ones. The classification of words according to the pronunciation of the accented syllable will be found of great assistance to the pupil. Write lists of words or sentences and mark words according to pronunciation.

Dictionary.

The correct use and study of the dictionary is a very essential part of spelling and pronunciation, and to stimulate this study a number of words and sentences should be put on the board each day with the word which is to be looked up underlined, and the pupils when called upon are expected to give the definitions. When words alone are given, sentences should be constructed showing the various uses of the words.

Review.

No successful results can be obtained in the teaching of spelling without systematic and thorough reviews. Frequent respelling of words helps to give a sense of mastery, and this important branch of spelling can be presented in an attractive way by the teacher. Spelling matches, though long practiced, are of great interest and value and are one of the best means for thoroughly reviewing former lessons.

Phonics.

Correct pronunciation is an important aid to correct spelling and the first step toward this end is the use of phonics. One cause of so many poor spellers is a lack of familiarity with the sounds of the language. Do not pronounce words for pupils when they can get the pronunciation by applying their knowledge of phonics. It is a good plan for the teacher to go over the next day's lesson with the pupils so they will be familiar with the pronunciation of new words.

Word Building.

Most pupils delight in word building, and a list of the commonest English prefixes and suffixes can be used in exercises in the smaller grades. The list can be enlarged as the class advances, taking in word analysis and Latin and Greek roots. Make out lists of words to which prefixes and suffixes can be added and explain the meaning of each, telling in what way it affects the root or stem of the word and note the change in spelling certain words.

Synonyms.

In teaching synonyms, lists of words can be put upon the board by the teacher and pupils called upon to give a sentence using synonymous words. This knowledge will be of great help in composition work and avoid the repetition of the same word.

Homonyms.

Homonyms, or words of the same sound but different meaning, always interest the pupil, and interesting lessons can be made by writing or dictating sentences in which two words of the same pronunciation can be used, leaving blank spaces to be filled in by the pupil. This exercise can be varied by some pupil dictating or writing on the board such sentences, the rest of the class telling the words which fit in the blanks.

Antonyms.

Antonyms can be made the subject of several interesting lessons by placing on the board a list of words and having the pupils, either in concert or when called upon, give a word with the opposite meaning. These exercises help to enlarge the pupil's vocabulary as well as permanently fix the meaning of the words.

Memory Study.

Spelling is essentially a memory study and therefore special attention should be given it throughout the intermediate grades. Pupils should not be allowed to write a word from dictation unless they know exactly how it looks correctly spelled. The proper time to learn how to spell a word is when the pupil first sees it. Cultivate the habit in the pupils of noting new words carefully and picturing them in their minds.

Neatness.

Insist on neat appearance and good writing, as well as correct spelling. Many teachers have blank spelling books for each pupil in which the daily lessons are written and marked according to spelling and general appearance. These are kept till the end of the year and shown to the parents of the pupil.

Memory Exercise.

An interesting and thought-producing lesson can be had every evening before dismissal by requiring the pupil having missed any word throughout the day to stand and spell such words before being dismissed. Such an exercise cannot help but prove an advantage to the pupils and will not only assist them in learning the words missed, but will encourage them to miss as few words as possible.

Written Exercise.

A splendid exercise for advanced classes is to write on special ruled paper, giving in addition to the spelling of the word the part of speech, the synonym and antonym, and using the same in a sentence. A lesson of this kind will prove much more beneficial to the student than any ordinary lesson.

Notebook.

If the teacher will require each pupil to keep a notebook containing the words misspelled by the pupil, such a book will be an interesting display of the pupil's ability and will prove an invaluable reminder for the study period. This notebook can be kept at the teacher's desk to be examined by friends and this fact will encourage the pupil to have as few words in the notebook as possible.

Drills.

If the teacher will keep a list of words misspelled in examination and written work and will have frequent drills on such words, it will enable the pupils to become familiar with the difficult words. The greater per cent of misspelling is on a very few words and if exercises as here suggested are made prominent these words will become part of the pupils' vocabulary.

Grouping Words.

Pupils will be interested in grouping words of a similar kind and the teacher will be surprised to note what lists can be readily prepared by examining some geographical subject or historical topic and having the pupils write all of the words which occurred to them in this connection. Awakening an interest on the part of the pupil is the all essential element towards success in any school work and very few pupils will show a lack of interest when such exercises are introduced.

Consistent Work.

We believe if the teacher would make every recitation a spelling recitation that there would be little use for a spelling book and for this special exercise on the program. It is much easier for a student to learn how to spell a

word correctly when used in connection with the regular recitation than by taking it up out of any connection, and for this reason we believe that every recitation should be made a spelling exercise in which the pupil becomes familiar with the difficult words.

Oral Spelling.

Various exercises may be used in connection with the oral spelling and since variety is the spice of school work, as well as elsewhere, it would be well for the teacher to vary the exercises frequently.

With some classes, spelling in concert might prove profitable exercise. One pupil may give the first letter of a word, another the second and so on. Such an exercise is sure to demand attention.

One pupil may pronounce and the others spell. Words misspelled may be passed by the teacher and taken up by the first pupil recognizing the fact.

The teacher may point out certain pupils to spell certain words so that it will necessitate every pupil being alert.

A pupil might be called upon to stand and spell a number of words while the others could write upon their slates the words misspelled.

Spelling down is another method of oral spelling which has always been profitable and interesting.

Lastly, but of special importance, is oral spelling from the phonic sounds. Such exercises should be frequent and will prove especially important to the pupil.

As a final exercise for the oral spelling class, the pupils might be called upon to spell as many words as they can recollect from the lesson.

Written Spelling.

Written spelling is much more profitable to the student than oral spelling. The successful teaching of spelling rests upon three things:

1. The method of teaching the original lesson.
2. The selection of words to be studied.
3. Frequent review of difficult words.

Practice.

Pupils learn to spell by practice rather than by studying long lists of words. Many drills in word writing will tend to the formation of accuracy in spelling.

Dictation.

Designate a certain paragraph or portion of some textbook, telling the pupils to observe carefully the spelling, punctuation, etc. Certain selected parts of the paragraph are then dictated by the teacher, the pupils writing the exercises in blank books kept for the purpose. These are collected, marked by the teacher and returned to the pupil, who is expected to write the misspelled words correctly at the end of each lesson. If this is not done the errors count on the following lessons.

Re-spelling.

One way of fixing upon the pupil's mind the habit of correct spelling is to require a pupil missing a word to erase the incorrect form, write the proper spelling and then spell the word aloud.

Short Lessons.

It is a great mistake to assign too large a lesson for this tends to make the pupil slight his work. Short lessons thoroughly mastered will be far more profitable to both teacher and pupil.

Grading.

The pupils' names may be written on the board and each given 100 per cent at the beginning of the month and for each word missed during the month 1

per cent can be deducted. This will encourage the pupil to greater effort and will result in much better spelling, since very few will be satisfied to see their percentages lowered, especially since public exhibition is made of same.

Root Words.

A very interesting recitation can be prepared by using certain prefixes and suffixes and listing all words suggested containing this prefix or suffix. Such an exercise can be made doubly profitable by defining the root word and showing the change in significance after the addition. This same exercise can be developed by using certain roots and making as extended a list as possible by the addition of prefixes and suffixes. There is no limit to the number of exercises of this kind which can be profitably developed and with the advanced spelling work it would be well to keep this information for reference and in a classified way. The following is a suggestive exercise:

Tract—Draw

Tract-or .....or=that which.
Tract-ion ..... ion=act of.
Tract-ile ..... ile=may be.
Tract-able ..... able=easily.
Abs-tract ..... abs=away from.
At-tract ..... at=near to.
Con-tract ..... con=together.
De-tract ..... de=away from.
Ex-tract ..... ex=out of.
Pro-tract ..... pro=out.
Re-tract ..... re=back.
Sub-tract ..... sub=from under.
Attract-ive ..... ive=tending to.
In-tract-able ..... in=not. . . able=easily.

A tractor is an instrument which draws.

Traction is the state of being drawn or act of drawing, as the traction of a muscle.

Gold is a tractile metal, as it may be drawn out in thin strips.

A tractable person is one easily drawn or managed.

An abstract manner is occasioned when the mind is drawn away from surrounding objects.

To attract people we must have power to draw them near to us.

To detract from a subject is to lessen or draw away from it.

An extract from a book is that part which is drawn out of it.

A protracted meeting is one which is drawn out or extended beyond the usual time.

When the claws of a cat are retracted they are drawn back.

When a number is drawn from under or taken away from another we subtract it.

That which tends to draw one to it is attractive.

An intractable student is one who is not easily drawn to his lessons.

Seat Exercise.

An interesting exercise may be given to the pupils while in their seats, by spelling around orally and each pupil writing down the misspelled words on their slates. The teacher can keep an account of the words misspelled and call upon the pupils to give the correct number. Such an exercise will show how many

of your pupils recognize the misspelled words and then all misspelled words can be written on the blackboard and copied correctly by the pupils upon their slates.

Correcting Exercises.

A very common form of recitation is for the teacher to pronounce the words and the pupils to write them either on their slates or in their notebooks and then after the pupils have exchanged their work, the teacher spells the words correctly and the pupils mark all incorrect spelling and when the roll is called give the number of misspelled words as indicated by the work. The work can then be handed to the original pupil and any misspelled words can be learned and the pupil may stand and recite them orally from memory.

Another way in which these written exercises may be corrected is to have some individual pupil spell the words and if any are misspelled the teacher can then make the corrections and all of the pupils may mark their slates in accordance with the correct spelling.

Assignment.

It is well understood that a lesson well assigned is half learned. For this reason the teacher should have the class pronounce the words of the next day's lesson and if there are any words that are not well understood the definitions should be given and the words should be used in sentences so that the pupil will understand fully the meaning of same. This is the opportune time to emphasize the correct pronunciation of the word and if the teacher will follow this plan in the assignment of their lessons, many poor lessons will be obviated.

Correcting Exercises.

After dictating ten or fifteen words to the class the papers or slates are exchanged and some pupil is called upon to spell the first word orally. The teacher asks those thinking the spelling correct to raise their hands and those disagreeing to do the same. All pupils having the word spelled wrong are called upon to spell it correctly.

Attention Exercise.

If the spelling class is limited in number, an exercise can be used which will be of great interest and require closest attention. Give each member in the class a number and after writing these numbers on the board dictate the words promptly skipping from one number to another with the pointer and requiring the pupil to spell promptly or pass.

Interesting Exercise.

One method of teaching oral spelling, which will prove interesting to the pupil, is to have the pupil remain standing after he has spelled the first word, calling upon one after another until all the class is standing, then as each one spells the second word he sits down until the class is seated again, provided he has not missed any words, otherwise the pupils remain standing until the missed words are respelled.

If recitations are given with the class standing, pronounce a word to the pupil at the head of the class and after he has spelled it ask all those who think there has been some mistake to raise their hands. If the word has been spelled correctly, the pupils raising their hands go below those who did not. If the word was spelled incorrectly the first scholar raising his hand is called upon to spell it and should he also miss it, another pupil is called upon, until the word is correctly spelled.

A wise plan, where pupils are writing the lesson on the board, is to give the words alternately so no help can be had from their neighbor.

One Pronunciation.

By pronouncing the words briskly and selecting the words promiscuously from the lesson, the pupil's attention is exacted. Do not pronounce a word more than twice and if the pupil does not hear it then, pass him and call on someone who did. Impress upon their minds that listening is as much a part of the lesson as spelling.

Head Marks.

When spelling orally if one pupil spells incorrectly the next one tries and if he spells the word correctly he goes above the first one. The same word is given again to the one who first missed it, thus fixing the proper spelling in his mind. Another word is then pronounced and the same plan followed. Those spelling correctly move up and those not spelling properly go down.

Vocabulary.

Pay particular attention to the vocabulary of everyday life and make the pupil familiar with the meaning and use of words used among well educated people, trying, if possible, to incorporate them into his everyday speech.

Objects.

Three results to be obtained by the successful teacher are:

1. Habitually correct spelling.
2. Correct pronunciation.
3. Correct use and meaning of words.

Imagery.

There are four ways in which a word is imaged in the mind of the pupil; the visual or seen object; the auditory or heard object; the vocal or sound of the word and the motor or written object. Many drills along these lines will greatly assist the pupil in the study of spelling.

Elementary Sounds.

The preparation of a list of words containing certain vowel sounds is a beneficial drill, and then to have the pupil become familiar with this sound is an essential part of one's education. A list of twenty-five words with short "u" and then repeating the sound until it is fixed definitely in the mind and continuing with all the elementary sounds will be very interesting and profitable. Work of this kind can be graded in the usual way and if a pupil gives words not containing the correct sound, it will be interesting to see what pupil will be able to mark such words diacritically.

Waste of Time.

It is the custom of many teachers to waste time by allowing the pupils to recite things which they already know. It is not uncommon for them to have spelling lessons of very common words which pupils have learned in years previous and while this has the appearance of busy work it is an absolute waste of effort on the part of the teacher and class. No time should be wasted with the commonplace, and effort should be made to specialize in everything. For this reason a list of words misspelled and drilled upon would prove very much more profitable than simply hearing the spelling lessons by rote. It is suggested that in passing over the spelling lesson attention be centered upon the few words misspelled and those words drilled upon during the coming lessons until they are known perfectly and that no time be wasted in rehearing the spelling of the words not missed.

Preparing the Lesson.

While it is disadvantageous to require pupils to study their lessons a certain number of times, inasmuch as it leads to undue haste and to slighting their work,

yet it is better to have work of this kind than to make no preparation. We believe that pupils could improve their work by studying their lessons a given number of times and that to practice such preparation would lead to the habit of study which would result in better lessons. We understand that the object of study should not be the number of times which a pupil can study a lesson, but should be the incentive of knowledge. But if this incentive has not been awakened on the part of the pupil it would be well for the teacher to attempt to arouse the pupil in some way and if the study of the lesson a certain number of times will occasion the desired end, it might not be a profitless experiment.

Rules.

There are a few special things that must be remembered and followed by the teacher in order to do successful work, and we call attention briefly to a few of these rules:

Words should be pronounced but once. This rule should be adhered to absolutely.

No speller should try twice. Any exception to this rule is significant of failure on the part of the teacher.

If one speller prompts another he should be immediately dismissed from the class.

Absolute adherence to rules of this kind will make harmonious work and will result in orderly recitations. While it is true that occasionally it might work a hardship to some pupil, yet for the general good, there must be no deviation from the rule.

A derivative word is one formed from the primitive by changing it internally or by adding a prefix or a suffix. For advanced spelling work no exercise is more profitable than the development of derivatives from given root words. This acquaints the pupil with the development of definitions and a splendid notebook can be prepared in the development of such exercises, which would become a reference book to the pupil in his future studies.

Syllabication.

Careful attention should be given to syllabication. We believe it unwise to require, in the regular spelling lesson, the pronunciation of each syllable. A few general principles should be deduced as a guide in this important feature of spelling. The necessity of dividing a word at the end of a line is so common that it is necessary not only from the standpoint of pronunciation but for the correct writing of the word that the pupils understand thoroughly the dividing of the word. If one can pronounce a word correctly he can ordinarily divide it into syllables. For this reason much attention should be given to the correct pronunciation of the word.

If two consonants occur between two vowels, one goes with each vowel. When only one consonant occurs between two vowels, the consonant usually goes with the second vowel. If this principle is understood by the pupil it will not only aid in syllabication, but also in pronunciation.

Composition Work.

One of the most interesting and profitable exercises for the development of accurate spelling is in the composition work, which must daily be a part of language lessons, nature study work and many other recitations. If great care is given to the correct spelling of a word and to the syllabication this composition work will result in a class of good spellers. The marked contrast is noted in the same grades by the different kinds of instruction given; with one teacher the written work is prepared carefully and the words carefully, while with another teacher there is no attractiveness to these written exercises and there is very little additional benefit to the pupil.

Plurals.

A few special lessons on the way in which plurals are formed will be interesting to the pupil and will prove very helpful to him later when this part of the grammar is under consideration. A lesson can be given on the development of each of the rules for forming plurals and the pupil later in taking this work in grammar will feel so acquainted with it that it will encourage him in the study of the subject.

Comparison.

A little drill can be given on the study of the comparative and superlative forms of adjectives, resulting in like benefit for a later study.

Gems.

A very helpful exercise in spelling is the dictation of certain gems of literature. In this way the pupil will be schooled in capitalization, punctuation and syllabication all interwoven with the mastery of the best thoughts. Acquirements of this kind will be the distinguishing features of the successful man in later life.

Tabulated Lists.

Hundreds of exercises can be given by giving the class five minutes in which to prepare lists on any given subject and grading the lists in consideration of number of words prepared and the correct spelling of same. For the primary pupils these lists might include toys, animals, fruits, birds, playthings, etc., and for the advanced classes, terms relating to civil government, names of our civil officers, names of presidents, grammatical terms, etc. Such lessons can be extended indefinitely and there is no limit to the number of subjects which can be treated.

Marks in Printing.

A useful chart can be prepared showing the marks in writing or printing and an exercise heard from this chart occasionally will keep these different marks in the pupil's mind and will acquaint him with their use.

Diacritical Marks.

To provide the symbol for each elementary sound, diacritical marks are used. In up-to-date schools much attention is given to phonetic spelling, but in many rural schools the study has been neglected. We urge upon the teacher to give her attention to this important feature of spelling, and give below a table of diacritical marks with names.

Marks.	Names.	Symbols.	Marks.	Names.	Symbols.
¯	Macron	ā	~	Tilde	ẽ
˘	Breve	ă	‗	Lower Bar	n̲
^	Circumflex	â	⊥	Suspended Bar	s̲
¨	Dots above	ä	—	Transverse Bar	₹
¨	Dots below	a̤	¸	Cedilla	ç
˙	Dot above	ȧ	⊥	Modified Macron	a̱
.	Dot below	ạ	⌒	Inverted Breve	a͡

We feel sure that a teacher will be well repaid in preparing a series of charts for the purpose of developing these elementary sounds and we suggest the four following charts, one of which we prepare, and the others can be prepared in a similar manner from the information given in the other tables.

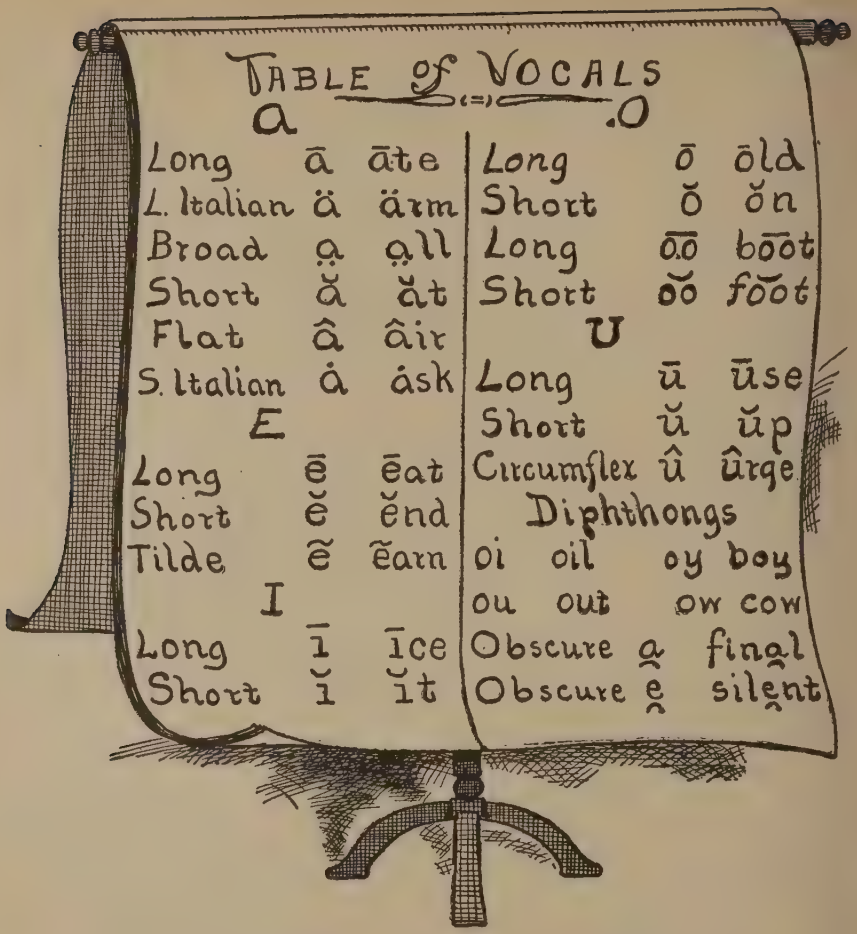

TABLE OF VOCAL EQUIVALENTS.

ạ	as in whạt	ŏ	
ã	as in liãr	ẽ	
ê	as in thêre	â	
ę	as in they	ā	
i	as in police	ẽ	
ĭ	as in fĭrm	ẽ	
ô	as in ôught	ạ	
ȯ	as in sȯme	ŭ	
õ	as in tailõr	ẽ	
o͝	as in to͝	o͞o	
o͝	as in wo͝rld	o͝o	
u͝	as in mu͝le	o͞o	
u͝	as in fu͝r	o͝o	
ȳ	as in crȳ	ī	
y̆	as in badly̆	y̆	
ȳ	as in mȳrtle	ẽ	

TABLE OF SUB VOCALS.

b	as in band
d	as in dead
g	as in gun
j	as in joy
l	as in lip
m	as in men
n	as in none
ng	as in sung
r	as in tar
th	as in then
v	as in vain
w	as in went
y	as in yacht
z	as in zinc
s	as in treasure
si	as in version

TABLE OF ASPIRATES.

f	as in far
h	as in hand
k	as in kind
p	as in pen
s	as in sin
t	as in tip
th	as in through
sh	as in shore
ch	as in chick
wh	as in whirl

SUBVOCALS AND ASPIRATE EQUIVALENTS.

ç	as in miçe	s
c	as in catch	k
çh	as in porçh	sh
ġ	as in ġin	j
n̰	as in pin̰k	ng
ñ	as in oñion	ny
s̰	as in phas̰e	z
x	as in box	ks
x̰	as in ex̰it	gz
ph	as in sylph	f
qu	as in quick	kw
q*u*	as in croq*u*et	k

SPELLING MATCH.

Nothing can take the place of the old-fashioned spelling match, in which the sides are chosen alternately and after the house is divided the spelling proceeds until only one remains on the floor. There are various ways in which this exercise can be changed in order to excite interest. One plan would be to have the leaders spell until one is spelled down and then the next one on that side to take the place and to continue until all are spelled down. Still another plan would be for the leader to choose any person on the opposite side when a word is missed on that side and so continue until all on one side are drawn over to the other.

RULES FOR SPELLING.

Give a lesson to develop each of the following rules and call especial attention to the facts:

Words ending in silent "e," or that have two vowels in one syllable contain a *long* vowel sound.

Most words ending in consonants have *short* vowel sounds.

Monosyllables and words accented on last syllables, ending in a single consonant, preceded by a single vowel, double the final consonant before a suffix beginning with a vowel.

Words ending in silent "e," drop final "e" when a suffix beginning with a vowel is added.

Words ending in "y," preceded by a consonant, change "y" to "i" when a suffix not beginning with "i" is added.

The most helpful books are those that in our early years serve as lights to pilot us into the wide harbor of the world's wisest and most inspiring literature.

—*James Wallingford.*

Psychology and Pedagogy

Psychology and *Pedagogy* are connected with those movements in education which deal directly with the student and the teacher. The foundation for this division is psychology. The general article on this subject is written from the viewpoint of the teacher and for the purpose of assisting those who are interested in learning the fundamental principles of this science and using them as a foundation for their methods in teaching. The articles on each of the important subdivisions, such as *Perception, Attention, Memory* and *Imagination,* contain directions for training the mental power described in the article. Not only teachers but parents will find these directions of great service.

The general article PEDAGOGY is in the main historical, giving a sketch of the pedagogical theories of the different periods of history and showing how one developed from the other and how the methods which are now in general use are the outgrowth of the principles and systems established by leading educators in the sixteenth, seventeenth and eighteenth centuries.

The general article *Methods of Teaching* is founded on the principles of psychology set forth in the general article on that subject, and the subordinate articles pertaining to it, such as *Memory, Imagination* and *Reason.* This article deals with the foundation principles of teaching which are applicable to the teaching of all subjects. Following this are descriptive articles on the two general methods known as the *Inductive Method* and the *Deductive Method.* The articles on special methods have a decidedly practical turn and show teachers how to proceed in a scientific and systematic manner in the teaching of the subjects to which these articles pertain, as shown in the list. The methods given in these special articles are based upon the principles in the general METHODS OF TEACHING.

The last division of the subject includes articles which are of general interest alike to parent and teacher. They do not pertain to any particular method of instruction, but bear a very close relation to all methods; hence they are given in this division. This comprehensive study of PSYCHOLOGY and METHODS OF TEACHING is so written that any one who has never studied the subjects can read them without difficulty and can easily grasp their meaning.

- MENTAL POWERS.
  - Knowing.
    - Perception.
      - Sense perception.
      - Realization of self.
      - Transferred perceptions.
      - Cultivation.
    - Memory.
      - Connection with habit.
      - Laws.
      - Kind.
      - Cultivation.
    - Imagination.
      - Phases.
      - Cultivation.
    - Thought.
      - Concept.
      - Judgment.
      - Reason.
      - Laws.
  - Feeling.
    - Classification.
      - Sensuous.
        - Organic.
        - Special.
      - Ideal.
        - Egoistic.
        - Altruistic.
    - Quality.
      - Pleasurable or Painful.
    - Intensity.
      - Amount of stimulus.
      - Prolongation of stimulus.
      - Change of stimulus.
    - Culture.
      - Childhood.
      - Effect of use.
  - Willing.
    - Attention.
      - Kinds.
      - Development.
    - Decision.
    - Execution.
    - Cultivation.

Marvelous as are the mind's achievements, we must note that it is as completely dependent upon the nervous system as is a plant upon sun, rain, and air. Suppose that a child of intelligent parents were ushered into the world without a nerve leading from its otherwise perfect brain to any portion of its body; with no optic nerve to transmit the glorious sensations from the eye, no auditory nerve to conduct the vibrations of the mother's voice, no tactile nerves to convey the touch of the hand, no olfactory nerve to rouse the brain with the delicate aroma from the orchards and the wild flowers in the spring, no gustatory, thermal, or muscular nerves. . . . No matter how perfect might be the child's brain and his inherited capacity for mental activities, his faculties would remain for his life shrouded in Egyptian darkness. Perception could give memory nothing to retain and thought could not weave her matchless fabrics without materials.

—*Halleck's Psychology and Psychic Culture.*

- PEDAGOGY.
  - Related Sciences.
    - Physical.
      - Biology.
      - Physiology.
    - Intellectual.
      - Logic.
      - Mathematics.
      - Natural sciences.
    - Moral.
      - History.
      - Literature.
      - Ethics.
  - Educational Movements. (History of Education).
    - Oriental Nations.
      - Relation to religion.
      - Importance of education.
      - Parseeism.
      - Education among the common people.
      - Education of women.
      - Israelites.
    - Ancient Classic Nations.
      - Development of the individual.
      - Greece.
        - Sparta.
        - Athenians.
      - Rome.
    - Christian Era in Europe.
      - Early Period.
      - Reformation.
    - United States.
      - Colonial period.
      - National period.
        - Land Grants.
        - Free Schools.
        - State Universities.
        - Bureau of Education.
  - Successive Methods.
    - Humanists.
      - The Early Christian Fathers.
      - Schoolman.
        - Monastic.
        - Knightly.
        - Secular.
    - Realists.
      - Contrast with Humanists.
      - Noted Educational Reformers.
      - Principles of Comenius (see extensive treatment).
    - The New Education.
      - Beginning.
      - Characteristics.
      - Reformers.
        - Locke.
        - Rosseau.
        - Pestalozzi.
      - Principles and Phases.
        - Child Study.
        - Subject Matter of Education.
        - Coördinative and Correlative.
        - Method of Teaching.
      - Bibliography.

QUESTIONS.—Psychology.

Which phase of mental activity, knowing or feeling, is first in consciousness? What is the most difficult stage of thinking? What can you say of its development? What are the two general methods of reasoning?

What is the first act of the imagination in constructing the image? Distinguish between memory and imagination.

What power of the mind would be exercised in thinking of the human head joined to the body of a horse?

Fairy tales belong to what phase of imagination?

Why are they adapted to the child mind?

During what period in life are most of our habits formed? Why?

In what way does interest differ from desire?

What is the relation of psychology to physiology?

What are the processes of obtaining an idea?

Explain how an action becomes a habit both from the mental and bodily standpoint.

For how long does the development of the brain continue? After that age knowledge is modified and attained through what means?

Compare the child's process of obtaining knowledge with that of mature minds.

What powers of mind are cultivated in the moral education? The mental? The physical?

What three steps are necessary in thought? Explain them.

What do we mean by the term logic? Logical mind?

What are some of the actions in life taken care of through habit?

Give processes of acquiring habit.

If it were not for habit how would the higher powers of the mind suffer? Would there be any development? Why not?

Why is it difficult for people to change their views or channels of work in middle life or old age? Of what great benefit is this to the progress of the world?

Through what channels is the mind aroused?

How is perception related to sensation?

Are ideas obtained through sight and touch to be depended upon?

Which ones of the senses are the most reliable and generally more accurately trained?

How can perception be trained?

What is the difference between conception and perception?

What is the chief thing accomplished by thought?

What stage of thought is judgment? What is its particular work?

Reason is what stage in thought? What is its work?

Why are subjects that appeal to observation and thought power valuable for memory training?

What depends in later life upon formation of correct concepts in early training?

Define interest; imagination; attention; apperception.

Where is the force of habit stronger, in the physical or intellectual powers? At what times is habit a protection from a physical standpoint? The intellectual standpoint? The moral standpoint?

Correlated Subjects:

Apperception.	Syllogism.	Sensation.
Concept.	History of Education.	Interest.
Association of Ideas.	Logic.	Habit.
Education.	Child Study.	Reason.
Pedagogics.	Fatigue.	Methods of Teaching.
Judgment.	Correlation.	Philosophy.

CHILD STUDY.—General.

What is included in child study? What is the aim? How can both teacher and parent assist in this?

By what is a child's ability limited?

Why should a teacher have knowledge of the physical condition of the child? Is this often ignored? With what results?

Why should a teacher be familiar with a child's environment at home? How does this affect her treatment of the individual child?

What effect does the mind have upon the body? The body upon the mind?

How has the subject of discipline changed? With what results?

What beneficial results have followed in the wake of kindergartens, normal schools, individual work by teacher, etc., in home, schools, community and to the child?

METHODS.—General.

What is meant by the term "method?" Upon what should it be based?

What is a "device?" Its general use? Is it ever harmful? When?

Why is application, or use, the true test of all knowledge?

What in general should be the aim of a teacher in her methods?

What is the great end and aim of education?

Which is the more important, principles or facts?

SENSES.

In what order are the senses developed?

What sense gives us the widest range of knowledge? What is the next in importance?

At what period of growth are the senses very keen?

Should any of the senses be trained to the neglect of the others? Is this often done in the schoolroom and home? What are the results?

Upon what powers of mind is the acquiring of knowledge based in the primary grades?

ATTENTION.

How does fatigue affect the mind?

Distinguish between voluntary and involuntary attention.

In presenting a subject what are the processes in securing the attention of the child?

Why should a lesson be conducted from the known to the unknown?

Upon what does attention depend?

Why is it easier to secure the child's attention in the early hours of the morning?

Why are recitations so often dull? What is lacking?

Why is it that many people make a failure of life in a certain sense? Where and how could this have been remedied?

What are some of the methods of training the attention?

What is the importance of attention in the development of the mind?

What are some of the methods of awakening the interest of the pupil?

Distinguish between interest and desire.

Why is it easier to interest the child than the adult?

What should govern the length of a recitation?

What are some of the ways of stunting mental growth?

How does interest in the subject affect the memory?

How can a child be taught to observe carefully and correctly? What is the importance of this? What powers of mind depend upon correct observa-

tion? At what time in life is observation the most important source of information?

MEMORY.

Upon what does memory depend? When is it especially active?

What are some of the devices a teacher may use to strengthen memory?

Is it possible to have knowledge without memory?

Is a child supposed to memorize what he does not understand? If so, how far is it practical to do this and with what end in view?

Why is memory of so much importance? Is it really a part of every other power of the mind?

What studies are especially valuable for training the memory?

How is memory affected by repetition?

How does interest in the subject affect the memory? What is the importance of interest in class recitals from this standpoint?

IMAGINATION (see Questions).

HABIT.

To what does a repetition of an act finally lead?

In what ways does habit affect the physical, intellectual and moral nature?

What do we mean by a plastic condition of the mind or nervous system? Why are habits formed more easily in early youth? After what age are important habits seldom formed?

In what ways can a teacher assist in the formation of good habits?

How does habit determine character ?

REASON.

At what age is a child supposed to begin to reason? Up to this time what has taken its place?

What is the importance of judgment in reasoning and upon what does it primarily depend?

In what grade of school work is the inductive method of reasoning best adapted? When and to what does this change?

What is the deductive method of reasoning and what department of school work is it best adapted to?

WILL.

What is instinct? What finally results from it?

What is the difference between an impulse and a desire? In which is the will brought into action?

What is meant by deliberation? To what action does it lead? What is the difference between a mature will and that of a child?

Why does choice involve so many difficulties?

Is will the means of preventing action as well as performing it? Give examples of both states of mind.

How may the will be cultivated? What factor is it in the formation of habits?

Upon what is stubbornness based? Is it an action of the will?

Will exercises what control over the feelings? Does its control extend at last to all mental powers? With what effect?

Why is will the highest of mental powers?

IMAGINATION.

Of what practical use is imagination? Upon what is worry based? Cheerfulness?

Difficult experiences in arithmetic, grammar and other studies are due to what?

Which is the broader term, memory or imagination?

Physics

I. Matter.
- 1. Definition.
- 2. Kinds.
  - a. Solids.
    - Properties.
      - Adhesion.
      - Cohesion.
      - Ductility.
      - Elasticity.
      - Density.
      - Porosity.
      - Malleability.
      - Tenacity.
      - Hardness.
  - b. Liquids.
    - Definition.
    - Hydrostatics—rest.
    - Hydraulics—motion.
    - Application of laws.
  - c. Gases.
    - Air.
    - Vapor.
    - Steam.
    - Atmosphere.
    - Properties.
    - Application of laws.

II. Mechanics or Dynamics.
- 1. Statics.
- 2. Kinetics.
  - a. Mechanical powers.
    - Lever.
    - Pulley.
    - Screw.
    - Wedge.
    - Wheel and axle.
    - Inclined plane.
  - b. Force.
    - Energy.
    - Composition of forces.
    - Gravitation.
      - Falling bodies.
      - Specific gravity.
    - Center of gravity.
      - Pendulum.
    - Momentum.
    - Parallelogram of forces.
    - Pneumatics.
    - Rotation.
    - Velocity.
    - Strength of materials.
    - Expansion.
    - Extension.
    - Capillarity.
  - c. Units of measurement (see Unit).
    - Dyne.
    - Foot pound.
    - Horse power.
    - Poundal.

III. Sound.
- 1. Production.
- 2. Propagation.
  - a. Waves.
  - b. Echo.
  - c. Reflection.

IV. Heat.
- 1. Definition.
- 2. Theories.
- 3. Sources.
  - a. Sun.
  - b. Friction.
  - c. Chemical action.
- 4. Temperature.
- 5. Radiation.
- 6. Boiling.
- 7. Freezing.
- 8. Specific heat.
- 9. Energy.
- 10. Laws and applications.

V. Light.
1. Sources
a. Sun.
b. Chemical action.
c. Mechanical action.
2. Reflection.
3. Refraction.
4. Regelation.
5. Diffraction.
6. Diffusion.
7. Polarization.
8. Aberration.
9. Actinism.
10. Focus.
11. Lens.
12. Color.
13. Spectrum analysis.
14. Rainbow.
15. Photometry.
16. Mirror.
17. Fluoroscope.
18. Mirage.
19. Aurora borealis.
20. N-rays.
21. Cathode rays.
22. Roentgen rays.
23. Lightning.
24. Optical instruments.

VI. Electricity.
1. Definition and theories.
a. What is electricity?
b. How produced?
2. Kinds.
a. Static or frictional.
b. Voltaic.
c. Positive.
d. Negative.
3. Laws and applications.
a. How does electricity travel?
b. Motive power, etc.
c. Electric light.
d. Electric heating.
4. Uses in medicine.

VII. Magnetism.
1. Theories.
2. Properties.
3. Kinds.
a. Natural.
b. Artificial.
c. Electro-magnetism.
4. Magnet.
5. Magnetic needle.
6. Laws and applications.

VIII. Physical Instruments.
1. Accumulator.
2. Aerostatic press.
3. Air compressor.
4. Air pump.
5. Archimedean screw.
6. Arc light.
7. Argand lamp.
8. Armature.
9. Barker's mill.
10. Barometer.
11. Blowpipe.
12. Crookes' tubes.
13. Camera lucida.
14. Camera obscura.
15. Electric battery.
16. Electric generator.
17. Electric machine.
18. Dynamo.
19. Electric meter.
20. Electric motor.
21. Electrode.
22. Electrophorus.
23. Electroscope.
24. Geissler tubes.
25. Induction coil.
26. Insulator.
27. Leyden jar.
28. Object glass.
29. Siphon.
30. Spectroscope.
31. Storage battery.
32. Voltmeter.

X. Miscellaneous.
1. Avogadro's law.
2. Boyle's law.
3. Demonstration.
4. Ether.
5. Fata Morgana.
6. Ice.
7. Liquid air.
8. Spheroidal state.
9. Vacuum.
10. Chemistry.
11. Armature.
12. Hydrometer.

What makes it so difficult to walk on ice?

Where is it desirous to do away absolutely with friction? What means are used to do this?

What forces are overcome in withdrawing a nail?

Give a short explanation of what would result if friction did not exist.

Give practical examples of cohesion and adhesion.

Which learns to walk more easily, the biped or quadruped? Why?

What is meant by the term "cold"?

What do you understand is temperature?

Why do you rub your hands together when cold?

Why does fire produce heat?

What do we mean by a conductor of heat? By what method is a poker heated? Flatiron?

Why are iron tools fitted with wooden handles?

When you touch ice, is it giving off cold or your hand giving up heat?

Does a fur coat produce heat? Why is it warm?

Why do you wear woolen garments in winter?

You stand at a heating stove to get warm; explain why.

How is heat imparted to a teakettle of water?

How does the sun heat the earth?

How is the expansion of heat used in practical ways? What are the uses of steam?

Why are feathers a warm covering for birds?

Why do men wear woolens in attending to furnaces?

What is the principle of the double window in winter?

When both are in the same temperature, which is colder, marble or wood?

How long does an object feel cold?

Why do we poke a fire to make it burn better?

What do we mean by "soft water"?

What is the cause of twilight?

Why do the stars seem to twinkle?

What is sound? Why can we be heard a greater distance by speaking through tubes?

Of what metal are lightning rods usually made?

Why is it dangerous to sit near a chimney during an electrical storm?

What substances are good conductors of electricity? Poor?

What is the distance of the sun from the earth? At what rate does light travel?

Some miles from the earth total darkness reigns. Explain light upon the earth.

Why does more rain fall by night than by day?

Why are clear nights usually cold?

Why does little dew form at the base of hedges and around the roots of trees?

Why is a running jump longer than a standing one?

What causes the formation of a rainbow?

What is a mirage? What produces the echo?

Ten inches of snow is equal to how many inches of rain?

What causes dew? Frost? Fog? What enables you to see your breath on a cold day?

Heat

I. Theory and Definition.
II. Sources.
    1. Natural.
        a. Sun.
    2. Artificial.
        a. Friction.
        b. Chemical action-electricity, etc.
III. Means of Travel.
    1. Conduction.
    2. Convection.
    3. Radiation.
IV. Properties.
    1. Expansion.
        a. Changes solids to liquids.
    2. Produces light.
V. Practical Application of Laws of Heat.

Correlated subjects: Rœntgen Rays, Electrolysis, Dynamo, Electric Light, Hydrometer, Falling Bodies, Expansion, Ether, Water Wheels, Electro Magnet, Theory of Light, Dyne, Poundal, etc.

QUESTIONS—HEAT.

What happens if a hot iron is placed on a cold one?
Can a body be cold and yet have heat?
What is heat?
Where does it come from?
Do the stars give off heat?
What causes fire?
How are our bodies heated?
How does heat travel?
What is the meaning of conduction?
What happens to the size of a body when heated?
Why are wagon tires made a little smaller than the rim of the wheel?
Give examples in expansion.
What happens to camphor when heated to a high temperature?
How does heat produce light? What body gives us both heat and light?
How do fur garments keep us warm?

QUESTIONS—LIGHTNING.

What causes lightning?
Is there lightning in cold weather? Why not?
When does lightning strike the earth?
What causes a thunderbolt?
Does the echo play any part in the loud peals of thunder heard?
Who invented the lightning rod?

QUESTIONS—ILLUMINATING GAS.

Who first used illuminating gas successfully?
When was it first introduced into England?
How is illuminating gas made?
What is coal gas? How made?
Where was the first coal gas obtained?
In making gas out of coal, what becomes of the tar and ammonia?
What is the condenser?
What is the use of a meter?
How is water gas made?
Which is the cheaper?
How does oil gas differ from water gas?

QUESTIONS—ICE.

When does water freeze?
When water freezes, how much does it increase its bulk?
Which is the heavier, ice or water?
Why does a pitcher break when water freezes in it?
Where is natural ice obtained?
What is the first step in harvesting ice?
How is the cutting done?
From what material are the ice houses made?
What is the ice packed in?
Where is the most expensive ice harvesting?
How is ice manufactured?
How is the marking done in harvesting the ice?
How is the ice hauled to icehouse?

QUESTIONS—LIGHT.

What is light? Where does it come from?
How is it produced?
The union of what two chemicals produces candle, lamp and gas light?
How is electric light produced?
How does light travel?
How fast does it travel? Does it travel faster than sound?
How many minutes does it take light to reach the earth from the sun?
How many years does it take for light to reach the earth from certain stars? Why?
What is the substance called that permits light to pass through it? Name five.
What is the substance called that does not permit light to pass through it? Name five.
What substances permit part light to pass through? Name three.
What is refraction?

The truest owner of a library is he who has bought each book for the love he bears it. In education the process of self-development should be encouraged to the fullest extent. Children should be told as little as possible and induced to discover as much as possible. —*Patrick.*

When I get a little money I buy books; and if any is left, I buy food and clothes.
—*Erasmus.*

Physiology

The study of PHYSIOLOGY is very interesting, but its value to the average student is in the fact that it acquaints him with knowledge that ministers to his well being.

This knowledge is originally gained by observation, experiment and by studying the conditions of diseases. While the information is of value from an educational standpoint, the care of the body, the prevention of diseases and the development of powers resulting in a better physique and longer life are the direct results of this study. Every home and school should be the center of such investigation.

It is impossible to carry on this study successfully without some sort of a guide. The suggestive outlines and questions here presented, with the practical treatment of these interesting subjects in THE NEW PRACTICAL REFERENCE LIBRARY, all presented in simple language by editors representing the latest research, opens up a field of study that should be utilized in every home and school.

For the guidance of the student we furnish herewith a general outline covering the subject as a whole. In addition we give you an outline covering the system of CIRCULATION and one of the subdivisions of the senses.

These outlines are simply developed from the material supplied in THE NEW PRACTICAL REFERENCE LIBRARY under the various headings related to same, and if the student will but make a complete outline covering the entire subject in accordance with the suggestions here submitted he will not only have an exhaustive study for future reference but the education it affords will be a source of untold pleasure and profit.

Human Body

Origin.
Cell.
Tissues.
Composition.
Organs.
Health.

I. BONES.
- Number.
- Structure.
- Kinds.
- Growth.
- Divisions.
- Articulation.
- Uses.
- Hygiene.
- Disease.

II. MUSCLES.
- Number.
- Structure.
- Kinds.
- Parts.
- Contraction.
- Use.
- Wonders.
- Hygiene.
- Disease.

III. DIGESTION.
- Organs.
- Secretion.
- Food.
- Processes.
- Wonders.
- Hygiene.
- Disease.

IV. CIRCULATION.
- (See extensive outline.)

V. RESPIRATION.
- Organs.
- Movements.
- Frequency.
- Air.
- Uses.
- Modifications.
- Hygiene.
- Diseases.

VI. NERVOUS SYSTEM.
- Definition.
- Organs.
- Uses.
- Special Sense.
  - Feeling.
  - Taste.
  - Smell.
  - Sight.
  - Hearing.
  - (See exhaustive outline on Ear.)
- Hygiene.
- Diseases.

QUESTIONS—PHYSIOLOGY.

How many bones are there in the human body?

In what way is a combination of strength and elasticity secured for the spinal column?

How many bones in the head? Why is it so carefully protected?

What is the bone formation of the wrist?

Describe motion of shoulder blade.

Between what ages does the condition of bone reach perfection?

Are teeth a part of the skeleton or of the skin structure?

What is the difference between the joint at the upper end of the ulna and the humerus? Can you detect a reason?

Of what is the hip bone, or tibia, at its upper extremity a good example as to joint? Give reason.

Can you give any reason for the fibula bone?

What is the science of Osteopathy?

Why are the bones of the aged more liable to break than in youth?

What is the function of the muscular system? What surrounds the muscles and for what reason?

What is the function of the muscular system?

What is necessary for muscular action?

Of what in general does the circulatory system consist?

What is the function of the lungs? What does oxygen do for the blood?

What aid do plants render to the blood?

Give the process by which the blood gives up its nourishment and carries away waste.

In what respect do the veins differ from the arteries?

What are capillaries? What is the function of the lymphatic glands?

What are the two great nerve systems? In general, what is the function of each?

In a case of indigestion, to which nervous system will the message be sent?

By what means has our knowledge of physiology been attained?

How does the human brain compare in size and weight with that of other animals? Who is said to have had the largest brain?

What is the most important characteristic of the blood?

How does the human brain compare in size and weight with that of other animals?

How does the weight of the cerebellum compare with that of the cerebrum?

What are the two great series of changes continually going on in the body?

In general what are the functions of the human body?

Describe the work of the salivary glands.

Give in general the function of the spinal cord.

How does the nervous system in some measure control the heart?

What is the chief use of fat?

By what device is the blood brought in contact with the air?

What are the relative positions of liver and stomach?

Is idiocy in any way dependent upon the size of the brain?

What are the organs of special sense?

What special protection is provided for the heart?

Would you expect the mitral valves to lift up or down?

Look up different articles on the subject and explain how bones are renewed.

Give the effect of iron upon the blood.

Explain the action of blood in case of a wound.

What is the function of the kidneys.

Why has blood a salty taste?

Could a person bleed to death from a small wound?

In case of general debility, in what condition would you find the blood?

The sensation of sight is carried by what nerve?

Do you think it possible to hear after the outer ear has been injured? If so, by what method?

Why is the aorta important?

What do you know of William Harvey?

Is there any difference between germs and bacteria?

Explain the term, "Germ Theory of Disease." How would you regard the spittle of a consumptive in reference to this theory?

What is the cause of tuberculosis of the kidneys, bowels, bones, etc.?

By what means is the waste material thrown off from the body?

Why are thin garments worn in summer?

What do you mean by the term "Out of breath"?

What are the causes of appendicitis? Is this disease connected with bacteria in any way? What is the particular danger in the disease?

In what part of the world does cholera occur? Why?

Explain the difference between allopathy, osteopathy and homeopathy.

To what end is the stethoscope used by the physician?

What are the causes leading to apoplexy?

Explain the growth of the hair, finger nails, etc.

In general trace the blood from the time it leaves the left ventricle until it returns to it.

How does the weight of the blood compare with that of the body?

Explain how blood is propelled through the body.

What are some of the causes of indigestion?

Why is mastication of food so important?

What is meant by a vital organ? Name and locate them.

What do we mean by "Chronic Diseases"? Name a few and the causes of same.

What is the function of tears?

In what manner is the skull constructed in order to protect the brain?

In case of cutting the thigh in front, where would you bind the wound, above or below?

What ultimately becomes of all fat taken into the body?

If receiving a wound, how can one tell whether the bleeding results from an injury to a vein or artery?

What are the causes of cancer?

Circulation

I. Organs.
   1. Heart.
   2. Arteries.
   3. Capillaries.
   4. Veins.

II. Parts.
   1. Pulmonic.
   2. Systemic.

III. Blood.
   1. Definition.
   2. Amount.
   3. Temperature.
   4. Kinds.
   5. Composition.
   6. Coagulation.

IV. Osmosis—Interchange of Blood Elements.

V. Causes of—
   1. Force of heat.
   2. Elasticity of arterial walls.
   3. Muscular action.
   4. Suction from veins.
   5. Suction in inspiration.

VI. Functions.
   1. Nourish.
   2. Purify.
   3. Warm.
   4. Trace the blood.

VII. Hygiene.
   1. Accident.
   2. Effect of exercise.
   3. Effect of air and sunlight.
   4. Effect of chill.
   5. Effect of pressure.

VIII. Diseases.
   1. Congestions.
   2. Inflammation.
   3. Scrofula.
   4. Cold.
   5. Catarrh.

IX. Related Processes.
   1. Absorption.
   2. Assimilation.
   3. Secretion.
   4. Excretions.

ORGANS OF CIRCULATION.

I. Heart.
   1. Definition.
   2. Shape.
   3. Size.
   4. Situation.
   5. Relation to surrounding parts.
   6. Weight.
   7. Proportion to body's weight.
   8. Structure.
   9. Parts.
   10. Openings.
   11. Valves.
   12. Nerve supply.
   13. Movement.
   14. The heart's work.

II. Arteries.
   1. Definition.
   2. Coats.
   3. Circulation in arteries.
   4. Pulse.
   5. Anastomosing.

III. Capillaries.
   1. Definition.
   2. Coats.
   3. Diameter.
   4. Circulation in capillaries.
   5. Office.

IV. Veins.
   1. Definition.
   2. Coats.
   3. Valves.
   4. Circulation in veins.
   5. Compared with arteries and capillaries.

What is circulation? Name the organs of circulation.

Describe the heart. Define arteries; veins.

Describe the circulation of the blood. Of what is blood composed?

What are the uses of the blood? What is the normal temperature of the blood?

What is the color of the blood in the veins? In the arteries? What causes the change?

Describe coagulation. What are the parts coagulated? What is the serum?

Give the functions of the red corpuscles.

What are the commercial uses of the blood?

Who were the first people who used the blood from butchered animals in making blood cake and blood sausage?

Fertilizers manufactured from blood sell at what price per ton?

Blood is used in the manufacture of what very important article of diet?

In what way is blood used in the manufacture of buttons? Imitation tortoise shell?

For what manufacturing purpose do the Japanese use blood extensively? For what do physicians frequently prescribe blood? Where can a supply be obtained?

Was the circulation of the blood known at the time of the discovery of America?

Who first examined the circulation of blood in the web of a frog's foot? When?

Distinguish between the pulmonic and systemic circulation.

What vein carries the blood to the liver? What is the function of the hepatic veins?

How long does it take the blood to make a complete circuit of the system?

How long does it take the whole amount of blood to pass through the heart?

What part of the weight of the body is the blood?

The skeleton of an adult is said to weigh 14 pounds. Does the blood weigh more or less?

A person of average weight (154 pounds) is said to have approximately 100 pounds water, 60 pounds muscle, 14 pounds bone, 12 pounds blood and 4 pounds brains. How do you reconcile these figures?

What four forces propel the blood?

What is the arch of the aorta? Does the aorta pass through the diaphragm?

Name the divisions of the aorta which supply the pelvis and lower extremities.

What is the name of the minute endings of the arteries connecting them with the veins?

Why is the inner coat of the arteries smooth?

Which coat of the arteries assists in propelling the blood? How?

When does an artery become a capillary?

What do you understand by the term "Anastomosis"? Explain its function.

How may one check the flow of an artery when severed?

Where are the capillaries the largest? Where are the smallest capillaries? How can you illustrate their size?

How does the heart of a reptile differ from other animals?

How is the heart suspended in the chest? With what is the heart surrounded?

Definition.
Situation.
Acoustic contrivances.
Parts.

I. External.
  1. Convoluted portion.
    Adaptability.
    Helix.
  2. Auditory canal.
    Length.

II. Tympanum.
  1. Definition.
  2. Situation.
  3. Size.
  4. Cavity.
  5. Opening.
  6. Filled with.
  7. Ossicles.
    Number.
    Names.
    Arrangement.
    Action.
    Function.
  8. Eustachian Tube.
    Definition.
    Length.
    Function.
    Connects what?
  9. Tympanic membrane.
    Definition.
    Position.
    Action.
    Function.
  10. Mastion cells.
    Opening.
    Abscesses; how caused?
    Function.

III. Labyrinth.
  1. Comparative anatomy.
  2. Situation.
  3. Bony labyrinth.
  4. Membranous labyrinth.
  5. Fluid.
  6. Vestibule.
    Opening into tympanum.
    Opening for auditory nerves.
    Opening for cochlea.
    Five openings into semi-circular canal.
    Otoliths.
    Fluid.
  7. Semi-circular canala.
    Number.
    Names.
    Positions.
    Function.
  8. Cochlea.
    Resemblance.
    Definition.
    Columella.
    Organ of Corti.
    Divisions.
    Partitions.

QUESTIONS.

What is the ear? What is the outer ear? What separates the outer from the middle ear?

What are the three bones of the middle ear?

What is the Eustachian tube? What is its function?

What are the parts of the inner ear? What are the organs of Corti?

Trace the transmission of sound from the outer ear to the brain.

Name bones of middle ear and describe their action.

What is the comparative size of the ear and its capacity of receiving sound in the lower animals?

Give three proofs showing the delicate sense of hearing in birds.

What animals are very dull in this sense?

In what animals is the hearing located in the legs? Is this also true of most insects?

How does the beetle hold its antenules in order to detect sound?

What animals have the keenest sense of hearing?

Is it possible for some animals to hear sounds which are pitched too high for the compass of the human ear?

Give three ways for influencing the propagation of sound to the tympanum.

What are the names of the nerves of hearing?

How are sound waves attracted to the auditory canal?

What is the eardrum? To what is it attached? How is its inner surface lined?

How does air enter the middle ear?

What is the eustachian tube?

Why are the bones of the middle ear called hammer, anvil and stirrup?

How are the vibrations of the eardrum transferred to the internal ear?

Where is the internal ear located?

How are the semicircular canals connected with the vestibule?

Why is the cochlea or snail shell so called?

Of what use is the fluid in the internal ear?

How are the sound vibrations which enter the ear reproduced?

How do the bones of the middle ear affect the vibrations?

What parts of the inner ear operate the same as do the strings of a piano?

What regulates the tension of the eardrum?

How are we enabled to recognize a multitude of sounds?

The thought we need, the facts we are in search of, may make their appearance in the corner of the newspaper, or in some forgotten volume long ago consigned to dust and oblivion.

—Charles F. Richardson.

Every difficulty that is overcome by a pupil's own efforts tends to develop in him an ambition to conquer other difficulties. Few, if any, joys can be compared with the ecstatic joy of victory. —"Thinking and Learning to Think," *Schaeffer.*

He teaches best who enables his pupils to dispense with his aid as he governs best who makes his rule unnecessary. —*Bishop Spalding.*

Reading

As READING constitutes the basis of the greater part of our knowledge, an important factor in the formation of character, the source of much of our enjoyment and happiness, the means of promoting individual and national growth, it has been our aim in the light of its importance to give it a thorough and interesting treatment in THE NEW PRACTICAL REFERENCE LIBRARY.

Every intelligent parent knows the importance and difficulty in these days of many books and sensational newspapers to make a wise selection for their children's reading. It is almost an axiom that the boy who is provided with good books will not select the worst for himself.

It is our belief that parents will welcome the splendid list of books found under the sub-topics in the article on "Reading." These lists have been most carefully selected, prepared and classified to fit the various grades and ages. Such books are bound to exert an influence of lasting good and, what is of far greater value, form a love for good reading. The topical list for adults is also very complete, taking up in turn works of standard authors of fiction, poetry, essays, dramas, etc., together with English and American authors in general. The reader is also referred to the general subject of LITERATURE, the treatment of which is closely allied to that of READING. It will thus be clear that by looking up correlated subjects and acquainting oneself with the various authors mentioned one is led into a very broad and practical field of valuable and entertaining study.

OUTLINE.

I. GENERAL PURPOSES.
   1. Thought-getting.
   2. Thought-giving.
   3. A love for good literature.
   4. Training powers of mind.
      a. Memory.
      b. Will-choice or selection.
      c. Imagination.
      d. Thought.
      e. Culture in general, polish and fluency in talking, etc.
   5. Means of acquiring practical knowledge.
   6. Means of mental, moral, spiritual and physical growth.
   7. Means of influencing others.

II. EARLY YOUTH.
   1. Primary.
      a. Acquiring thought—learning to read.
         Methods.
         Study.
         Recitation.
      b. Material.
         Course of study in public schools or other institutions.
         Supplementary reading suited to age. (See List.)

c. Objects.
Correct pronunciation.
Natural tones.
Correct expression.
Knowledge of words.
Excite interest for further work.

III. Youth.

1. Intermediate and Grammar Grades.
a. Purposes.
Fluency in oral expression.
Silent reading.
Love of good literature.
Cultivation of choice.
b. Methods of teaching.
Sustain interest.
Intellectual element.
Discussions and explanations.
Historical and geographical setting.
Understanding of all allusions.
Comprehension of subject matter.
Appealing to imagination.
Reference work taken up to great extent.
Supplemental reading on all subjects. (See List.)

IV. Adult.

1. Attitude of mind.
a. Interest.
b. Enjoyment.
2. Cultivation of taste continued.
a. Means.
Best authors.
Beauty of expression.
Exercise of power in any direction.
Description.
Instruction.
Indulgence, individual tastes.
Dangers of.
Advantages of.
Enjoyments of.
Importance of.
3. Results of correct reading.
a. Usefulness in world.
Home.
Business.
Social.
b. To oneself.
Development.
Moral.
Intellectual.
Spiritual.
Physical.

V. Books for Young Folks.

1. See lists given.
a. Primary.
Hiawatha Primer.—Holbrook.
Classic Stories for Little Ones.—McMurry.
When Life Is Young.—Dodge, etc., etc.
Others.

b. Intermediate grades.
Tanglewood Tales.—Hawthorne.
Hiawatha.—Longfellow, etc., etc.
Others.
c. Grammar grades.
Works by the following authors: Irving, Whittier, Holmes, Cooper, Field, Lowell, Shakespeare, Twain, Church.
d. High school.
Competent to select their own reading from standard literature of all countries and authors. (See list in NEW PRACTICAL REFERENCE LIBRARY under reading literature.)

VI. BOOKS FOR ADULTS.
1. For suggestive lists see sub-topics under Reading of
a. Fiction.
b. Narrative poems.
c. Essays.
d. Dramas.
2. American and English literature under Reading.
3. Literature as treated in THE NEW PRACTICAL REFERENCE LIBRARY.

QUESTIONS.

What great influence have state and national libraries had upon the world?

Turn to the subject of Libraries in THE NEW PRACTICAL REFERENCE LIBRARY and notice what the world is doing along this line.

Have you a library in your town? Your county? What factor are you in its growth?

What is being done along practical lines with the reading circles, etc.?

What is the history of the Library of Congress? Name some noted libraries of the United States.

Why are elaborate courses of reading often failures?

What factor is interest in the subject of reading? How may this be cultivated? Is individual taste a strong trait in interest?

What are the dangers of indulgence in individual taste?

Why and how should individual taste be cultivated? What does this lead to in literary writings?

What are the literary merits of a work? Where do we find these in perfection? Do they appeal to all alike? Why not?

How can we cultivate an appreciation of literary style?

When and how is time wasted in reading?

Is it necessary that all reading be on the instructive order?

What style of reading appeals directly to the emotions? Why is it essential that this class of literature be of the best?

What does the novel portray? What is its scope? What importance is it in education? Name standard ones with their authors.

What powers of the mind are exercised in the reading of an essay? How does it affect the life outwardly? What are some noted essays and by whom written?

What influence has the reading of poetry upon the life?

Suggestions on Reading

The basis for all instruction in school work is reading, since to understand any subject it is necessary for the pupil to be able to read intelligently. The suggestions which we offer here will not be an exposition of the various methods now in use; we feel quite sure that every progressive teacher is more or less familiar with the different methods. The one thing in particular that we have in view is the creating of interest in this recitation. We have emphasized throughout the EDUCATOR the necessity of variety in the securing of interest, and for the assistance of the beginning teacher and the one not gifted in originality we supply a list of one hundred suggestions and devices which, if intelligently used, will insure an interest which cannot be secured where no new methods are introduced.

That the reading exercise may not conduce to bad habits it is essential that careful attention be given to the selection of the reading matter and that it be adapted to the student's needs. We believe the thoughtful teacher will give every attention to this important matter, and by spicing this exercise with the suggestive material here presented, every lesson will prove an inspiration and result in especially fitting the pupil for the understanding of all the subjects, since reading must enter largely into this knowledge.

Be sure that pupils are thoroughly familiar with all the words in the lesson, their pronunciation and meaning, before expecting them to read a selection correctly.

The teacher should study the sense of the piece and see that the pupil understands it also.

Remember that reading, not elocution, is the subject to be taught.

Beginners should not have too many new words presented to them at once.

There is a possibility of laying too much stress upon exactness in some vowel sounds.

It is advisable that pupils should stand while reading, that the teacher may see the entire person and be able to criticize the position.

Monotony of expression can be remedied by having the pupil read with the teacher and by persistent drill.

Reading by the individual is always more important than reading by the whole class.

Cultivate a feeling of ease and freedom from embarrassment on the part of the pupil; it will help him greatly.

Care should be taken not to train the pupil merely to imitate the teacher in reading after her.

Pupils must be trained to take in the sense of a line at a glance. This is absolutely necessary to insure intelligent reading.

Allowance must be made for natural weakness or other defects in the voice.

Let the teacher give several sounds common to a number of words and then ask the pupils to give the words containing them.

Pay careful attention to the position of the pupil while reading; he should stand straight, well balanced on his feet, and holding the book easily at a proper distance from his eyes.

Practice should be had in giving the elementary sounds when the word is spoken, and vice versa.

Let the pupil form words by combining vowels with consonants given him by the teacher, and vice versa.

Let the pupils reproduce in correct spelling words written phonetically on the board by the teacher; or let them spell the word phonetically from seeing it written in the ordinary way.

Have the class form other words from seeing the sounds of one word indicated phonetically on the board.

The pupils should be allowed, even encouraged, to criticize one another, but always in the right spirit.

Let the same paragraph be read in succession by different members of the class, and let corrections be suggested on the reading of each before the next reads.

The teacher's first duty is not to criticize nor to judge the pupil's work, but to teach him to appreciate the beauties of the selections being read, and to read them himself in such a way that others may appreciate them also.

Mistakes in pronunciation should be corrected wherever and whenever they occur.

Wherever possible the teacher should, by comment, explanation and illustration, connect the matter of the reading lesson with the every-day life of the pupil.

Exercises in spelling will often enliven the reading lesson.

Questions on the reading lesson should be adapted to make pupils observe and think for themselves.

Most interesting reading matter may be found in historical stories.

Train the pupils often and thoroughly in pronouncing elementary sounds, syllables and words chosen for the purpose.

Young children cannot be expected to profit much by rules; they can learn best by imitating the teacher. Her pronunciation, therefore, should be perfect.

Encourage the pupils at all times to seek help in pronouncing difficult words and be ever ready to assist them.

The vocal organs of the children will receive no training that the teacher does not give them.

Advantage may be derived from hearing children with similar voices or faults in reading in the same division.

Do not fail to illustrate the thought of each paragraph so plainly that every pupil will comprehend it.

Every helpful, ennobling thought occurring in the lesson or suggested by it should be strongly impressed upon the pupil.

Dialogues will be found well fitted for reading lessons. Assign a part to each pupil and make a special effort to secure the best expression possible.

At times, especially in reviews, allow one pupil to read several paragraphs without interruption. It will tend to give him ease and freedom in reading.

The pupils should be questioned on the points of the story, both at the opening of the recitation and during its progress.

It may be well to mark emphatic words on the page, or have them written on the board, and see that in the reading they get the emphasis due them.

Effort should always be made to secure the interest of parents in having the children take their books home and read there.

As the primary object of learning to read is to secure information, getting the thought of the paragraph should be considered as of even more importance than correct pronunciation.

A fault should never be corrected without showing the pupil the right way. The lesson should be carefully looked over by the teacher in advance and no lesson beyond the powers of the pupils assigned.

It may be well in particular cases to make use of exercises chosen especially for their difficulty and drill the pupils systematically in pronouncing these difficult sounds.

Great benefit will be derived and a special effort will be secured by having certain pupils take a conspicuous place before the class and read a selection, being then criticized by all.

Careless enunciation should never be tolerated.

Have the teacher give the meaning of certain words occurring in the lesson, and with this information let the pupils locate the word.

Renewed interest can be secured by taking a good story from a magazine, cutting it up and passing the pieces around to be read by the pupils in class.

Have the pupils suggest synonyms for suitable words occurring in the lessons.

Patience must be exercised with the slow and dull.

It may be discouraging to a pupil to interrupt him while reading in order to correct him. Good judgment must be used in this.

Let each pupil present a list of words which he found difficult to pronounce; then have the brighter pupils try them, before the teacher.

Let the pupils give words of opposite meaning to difficult words occurring in the day's lesson.

The pupils may be asked to change statements to questions and affirmations to negations, etc. They may also be asked to change stanzas of poetry to prose.

Older pupils may be required to write a whole paragraph in other words than those used in the book, but giving the same sense.

Draw the pupils' attention to the different literary qualities by having them select paragraphs especially illustrative of those qualities.

Show the importance of punctuation by special sentences, such as the following: "What, do you think I can walk to school in the rain?" "What do you think? I can walk to school in the rain."

Constant drill should be given to remedy reading too fast or too slowly.

Do not neglect any opportunity of enlivening the lesson and broadening the pupils' information by having them look up all references to history, science, etc.

Where occasion offers, show how a different meaning may be given to the same words by altering the emphasis.

The pupil should not be expected to profit by the exercise of reading a whole paragraph aloud after the teacher; take a sentence only, or a clause.

Endeavor to have the pupil feel confidence in himself; it will make his reading easier for him.

Pupils can be taught to read more slowly by having them make a pause after each word, or by having each pupil read a word in turn.

Give your pupils occasional drill in such fundamental things as the sounds of the letters, pitch, stress, etc.

Require correct spelling of all or a part of the words in the lesson each day.

Plan your work carefully at least one day ahead.

Increased interest can always be secured by introducing some supplementary reading.

Make as much study as circumstances will permit of the lives of the authors read in the supplementary work.

Have one pupil read until a mistake is noticed by one of the others; then let the latter take it up.

At times have the older pupils in succession take charge of the class and conduct the recitation, the teacher always guiding the work.

Have a slow reader and a rapid one read together and insist on their keeping together.

Beware of drilling some one pupil too long on the same thing. He must not be tired out or discouraged.

Another useful exercise to remedy too rapid reading is to have the pupil read backward.

Endeavor to look at the difficult things from the pupil's standpoint as well as from your own.

Show the pupil just how the incorrect manner of reading impresses the hearer by reading it incorrectly aloud yourself.

Allow the pupils occasionally, where it seems advisable, to suggest readings from papers or magazines, and vary the work by having these read in class.

Have some especially good pieces of literature, both prose and poetry, committed to memory by all.

Consider that method best which brings into the class the most interest and effort, and to the pupils the greatest improvement in reading.

With very young children it will be well to read to them considerably, rather than to tire them by too much drill.

Select your supplementary reading matter with a view, at least partly, to the educational value of the information it contains.

With older pupils have supplementary selections read in class by certain ones, and lay stress on the importance of learning to read as a means of acquiring information.

You should have in your school library books especially chosen for their fitness for use in supplementary reading, on such subjects as science, manufactures, business, transportation, history, literature, biography, etc.

Do not work directly through your reader in the order there used with any one class, but alternate the selections of the reader with the supplementary work.

Strive in every way possible to develop the imagination of the children; teach them to picture in their minds what they read.

Have narrative selections in which conversation occurs put into dramatic form, and vice versa.

Vary the reading matter to meet the interest of the children; they cannot profit by reading a selection in which they are not interested.

Give the older pupils constant training in using the dictionary.

Much interest can be introduced into the reading lesson with older pupils by having occasional exercises in the derivation of words and their analysis.

If you can create an interest among your pupils to read the books in your school library you will secure greater interest in the class work also.

While reading the simple American classics, put to the pupils questions on the text, having them answer in the words and expressions of the author, as describing characters, situations, etc.

In this work in the classics among the older pupils, freedom of discussion on characters and plot should be encouraged, and possibly debates arranged for on similar subjects.

It may be that you can interest your pupils in drawing on the blackboard scenes illustrative of the text.

The acting out of some part of a classical play read with the advanced classes may sometimes be done to advantage; or of some poem or story that the class has dramatized.

The assigning of definite topics to be prepared by the pupils will be found to be helpful in studying the classics.

Ask questions on the text that will make the pupils think and see the important points, qualities or characteristics.

Books, schools and education are the scaffolding by means of which God builds up the human soul. —*Humboldt.*

Religion

In THE NEW PRACTICAL REFERENCE LIBRARY we not only give you a long article on the Bible, but we also treat the separate books of the Bible under their separate titles, or under names of famous characters associated with them.

Much information will be found on the subjects of the religious history and the religious thought of the world.

This LIBRARY is designed to be a useful, convenient companion in the study and the proper understanding of the scriptures, since it brings in alphabetical order the chief names, persons, things and events referred to in the Bible and gathers into condensed form much, not only from the Bible, but through outside sources.

We also treat the various religions embracing their history, doctrines and successes.

OUTLINE.

I. POLYTHEISTIC RELIGION.
- 1. Brahmanism.
- 2. Buddhism.
- 3. Confucianism.
- 4. Shintoism.

II. MONOTHEISTIC RELIGION.
- 1. Judaism.
  - a. High priest.
  - b. Rabbi.
  - c. Sanhedrin
  - d. Passover.
  - e. Talmud.
- 2. Roman Catholic.
  - a. Distinctive features.
- 3. Protestantism.
  - a. Distinctive features.
- 4. Mohammedanism.
  - a. Distinctive features.

III. SACRED BOOKS AND WRITINGS.
- 1. Bible.
  - a. Books—Authors.
  - b. Noted characters.
  - c. Apocrypha, etc.
- 2. Koran.
  - a. Mohammedanism.
- 3. Vedas.
  - a. Brahmanism.
- 4. Talmud.
  - a. Judaism.

IV. SECTS AND SOCIETIES.
- 1. Ancient.
  - a. Anabaptists.
  - b.
  - c.
- 2. Modern.
  - a. Y. M. C. A.
  - b. Sisters of Charity.
  - c. W. C. T. U.
  - d. Good Templars.
  - e. Red Cross.
  - f. Capuchins.

V. BIBLICAL CHARACTERS AND PLACES.
- 1. Jerusalem.
- 2. Moses.
- 3. Palestine.
- 4. Solomon.
- 5. David.
- 6. Jesus.
- 7. Rome, etc.

VI. MISCELLANEOUS.
- 1. Doctrines and ceremonials.
  - a. Atonement.
  - b. Baptism.
  - c. Celibacy.

d. Predestination.
e. Transmigration of souls.

2. Institutions.
a. Apostolic succession.
b. Church.
c. Missions and missionaries.

3. Miscellaneous terms.
a. Pope; patriarch; nirvana, etc.

CORRELATED SUBJECTS.

Byzantine art	Milton	Nazarene
Burnt offering	Priest	Christmas
Easter	Prophets	Moravian Brethren
Religious liberty	Huguenots	Pope
Talmud	Free Church of Scotland.	Positive philosophy
Shakers	Monastery	Creed
Jesus Christ	Miracle	God
Jerusalem		Synagogue
Monotheism		

QUESTIONS—RELIGION.

What is religion in its broadest sense?

Give proof that it is common to all races of mankind.

What do we mean by "world religions"? What is the prominent characteristic of them as a whole? Name them. Who was the originator of each?

What is a monotheistic religion? Name those existing today.

Locate and give characteristics of believers in Mohammedanism, Buddhism, Confucianism, Christianity. Number of followers of each?

Was the state and church one in former times? What has caused their separation?

What do we mean by religious liberty? Compare the condition today with that of ancient times.

At what time and in what nation did religious toleration originate?

What is Christianity? What factor has it been in the history and progress of the world?

Is a nation's growth in any way dependent upon its form of religion? What of the Grecian and Roman civilization in this regard? Why was it not enduring?

What are some of the forms of religion in savage tribes?

Can mythology be regarded as a form of religion?

What influence has the United States exerted on the world in regard to religious toleration?

Upon what principle were many of the Colonies established in America?

MORMONS.

By whom was the Mormon Church formed?

At what age did he claim that the first two persons of the Trinity had visited him?

When were the plates of the Book of Mormon delivered to him? Describe them. In what language were they written? When and by whom translated?

After translation to whom is it claimed the plates were delivered?

Were missionaries sent abroad in the interests of the faith?

How many thousands were converted and baptized in England in two months?

Was much opposition encountered during the early years?

When did the Mormons remove to Utah?

When was polygamy prohibited by act of Congress?

What is the membership now?

Transportation

One of the most important factors in the rapid growth of nations along commercial lines during the last fifty years is that of up-to-date methods of TRANSPORTATION. The extensive internal commerce of the United States is a surprising feature of this growth due to the vast systems of railroad lines permeating every section, from Atlantic to Pacific, from Canada to Gulf. Not of the United States alone is this true, but the phenomenal growth extends to all parts of the world, bringing into close touch all the nations of the earth. The handling and manipulation of the world's vast products has also been helped by legislation in different countries. The subject of FREIGHT is discussed in a very thorough and up-to-date manner in THE NEW PRACTICAL REFERENCE LIBRARY, together with the legal phases of the subject under heads of HIGHWAYS, INTERSTATE COMMERCE ACT, COMMON CARRIER, MUNICIPAL OWNERSHIP, etc.

The great question of reducing the time, inconvenience, and annoyances to which the traveling public is subject is amply discussed under the heads of RAILROADS, ELECTRIC RAILWAYS, STREET RAILWAYS, SHIP, etc. The subject especially interesting at present, AERIAL NAVIGATION, is treated under general head of FLYING MACHINE. The timely and interesting subject of AUTOMOBILES is also fully discussed.

Some of the greatest engineering feats of the world have been necessary in opening up new territory or improving lines of travel, but in either case it has been accomplished, and the methods and results are fully discussed under titles above mentioned in our NEW PRACTICAL REFERENCE LIBRARY.

Railroads

I. HISTORY.
- 1. Early history.
- 2. Development.
- 3. Leading countries.
- 4. Approximate mileage.
- 5. Great railroads (which see).
  - a. Cape to Cairo.
  - b. Trans-Siberian.

II. CONSTRUCTION.
- 1. Location—how determined?
- 2. Surveys.
- 3. Roadbed.
  - a. Width for single track.
  - b. Width for double track.
  - c. Grading.
  - d. Ties.
  - e. Rails.
  - f. Ballasting.

III. EQUIPMENT.
- 1. Rolling stock.
- 2. Station.
- 3. Depot.
- 4. Shops.
- 5. Yards.
- 6. Water supply.
- 7. Signals.
- 8. Telegraph and telegraph lines.

IV. ORGANIZATION.
1. Stockholders.
2. Directors.
3. Officers.

V. SIGNALING.
1. Block system.
2. Telegraph.
3. Automatic.
4. Banjo signal.
5. Semaphore.
6. Banner.

VI. CONSOLIDATION.
1. Object.
2. Advantages.
3. Results.
4. Recent legislation.

Early History *

I. ROME.
Track consisted of two lines of dressed stone.

II. ENGLAND.
First approach at modern style.
1602—Wooden rails—Tramway.
Later flat strips of iron added.
1767—Cast iron rails introduced.
1769—Upright flange added to rail.
1829—First modern railroad—Liverpool & Manchester.
Steam as motive power successfully introduced.

III. UNITED STATES.
1826—First horse power—Quincy, Massachusetts, to coast.
Use—To carry stone for Bunker Hill Monument.
1829—Delaware & Hudson Canal Company.
Length—Sixteen miles.
Horsepower and stationary engine at first.
Use—Carry coal, Carbondale to Honesdale, Pa.
First locomotive, Stourbridge Lion, imported from England.
1830—Baltimore & Ohio opened for traffic.
First road for passengers and freight.

QUESTIONS.

What railroads pass through your city? Your county? What are their terminal points?

Give five ways in which they are an aid to you.

When and where was steam introduced as a motive power in railway affairs?

What is the usual length of a rail? Its weight? Its height? What is the length of ties? Their thickness? How far apart are they placed?

When and upon what road were dining-cars first used?

Describe a modern first-class passenger train and tell of what it consists.

Explain railway signaling. The block system.

How does the mileage of the Vanderbilt system compare with all the railroads of Canada? Of Italy? Brazil? Mexico?

How does the length of the Trans-Siberian Railway compare with the distance from London to New York? From New York to San Francisco?

What creates a demand for railroads? Why are they the natural pioneers in opening up new territory? What are their methods along this line?

What are known as the pioneer railways? Where located?

What enterprises follow in the wake of railroads?

*From the general outline we expand the first sub-topic, "Early History": in like manner have the pupil develop the several divisions of this very interesting and timely subject.

What can you say of the manufacture of American locomotives? Are they in demand abroad?

What is the largest locomotive works in the United States?

What were the direct results of the Interstate Commerce Act? When was it passed? What late movement has taken place along this line, and why was it necessary?

What danger to the public lies in sharp competition of railway lines?

When did Pullman make his first sleeping-car? Where first used? How are the Pullmans used in connection with railway lines?

What system is followed in the transportation of freight?

What state of affairs seems to call for a consolidation of the railroads? What good results? What evil?

What is the system of brakes now in use on passenger trains?

What is the average weight of a passenger locomotive? Its size? Its cost? Of a freight locomotive?

What is the size and cost of a standard sleeper? Of a tourist sleeper?

The United States has what percentage of the railway mileage of the world? How does it compare with that of Germany and England?

What country has approximately one-half of the railroad mileage of the world? Which has the greater mileage, Great Britain or Germany?

How many miles of railroad were built in the United States between 1830 and 1831? How did this compare with the world?

What is said regarding railroad construction in the United States from 1835 to the beginning of the Civil War?

In what year was the New York Central completed to Albany?

If there are 500 oak trees to the acre of timber and each will yield ten railroad ties, how many acres of timber necessary to furnish the ties from your railroad station to your county seat? To your nearest shipping point?

At what time were railroads built with rails made of dressed stone? Of wood? Of tin? Cast iron?

What motive power was used on the first railway built in the United States?

How many miles of railway were there in the country at the beginning of the Civil War?

If all the railroads of the United States were made into a single track. how many thousand miles would it extend beyond the moon? Running forty miles an hour without a stop, how long would it take a train to go from one end of this track to the other? How many times would this single track reach around the earth?

Life of Car Wheels—Statistics gathered from various railroads show that perfect car wheels often roll from three hundred thousand to four hundred and fifty thousand miles before they have to be turned down. Wheels with flaws in them run only about fifty to ninety thousand miles.

Telegraph

I. Definition and Uses.
II. Kinds.
    1. Electrical telegraph—Morse system.
    2. Submarine cable—Morse system.
    3. Wireless—Marconi system.
III. Apparatus.
IV. Detailed Description of Work.
V. History.
VI. Results to World.

Electrical Telegraph

I. Definition.
   1. Apparatus.
      a. Battery or source of current.
      b. Transmitter or key.
      c. Line wire to convey current; telegraph poles, etc.
      d. Receiver or sounder.
II. Technical Description of Work.
III. History.
   1. 1837—Exhibition of the Morse plans.
   2. 1840—Patent obtained.
   3. 1844—First line completed—Washington to Baltimore.
   4. System of signals adopted, etc.
   5. Extension of work.
      a. Submarine cable, etc.
      b. Establishment of system throughout world.
      c. Inventions extending its usefulness.
IV. Statistics of Mileage, Etc.
   1. United States.
   2. Foreign countries.
V. Other Systems.
   1. Bonelli.
   2. Wireless.
VI. Commercial Value.

QUESTIONS.

When and by whom was the telegraph invented?

From your own observation what essential parts and instruments are necessary in a telegraph office?

By illustration follow a message sent from Chicago to St. Louis. What does A represent? B?

What is a relay?

Which is more rapid, the telegraph or telephone, for communicating between long distances? Give two reasons for your answer.

What signal honor was given Morse by ten countries?

Give a short account of Prof. Samuel Morse. Along what lines other than electricity was he interested? To whom did he apply for funds with which to establish the first experimental line of telegraph? Where was the first line established?

Who was John W. Mackay? What telegraph companies did he form?

In what way did Alfred Vail assist Morse?

What device invented by Edison has been of great value in telegraphy?

Did Congress at first have faith in the proposition?

What are the two main telegraph companies?

Who is the inventor of the wireless system? Is this being used to any practical extent? Where is its use especially beneficial?

In what ways does the telegraph accelerate business? Is the growth of a nation along commercial lines in any way dependent upon it? How?

In wireless telegraphy the distance of the message depends upon what?

What is the conductor in the Morse system? In the Marconi system?

Which is cheaper, the construction of wireless telegraph stations, or a submarine cable?

What are some of the wireless telegraph stations? How far apart are some of them?

What are the points of resemblance and difference between the Morse and Marconi systems?

Why can the wireless system be used to better advantage on sea than land?

In what department of the army is this system being used largely?

Canals

I. Definition and Purpose.
   1. Navigation.
   2. Irrigation.

II. Construction.
   1. Locks.
   2. Reaches.
   3. Inclines.
   4. Dams.
   5. Lifts.
   6. Work in general.

III. Ancient.
   1. Egyptian.
   2. Chinese.
   3. Romans.

IV. Modern.
   1. European.
   2. American.
   3. Miscellaneous.

V. Related Subjects.
   1. Docks.
   2. Waterworks.
   3. Aqueduct.

VI. Important Canals.
   1. Names.
      a. Panama.
      b. Suez.
      c. Erie.
      d. Sault Sainte Marie.
      e. Welland, etc.
      f. Manchester Ship.
      g. Kaiser Wilhelm.
      h. Chicago Drainage.
   2. Location.
   3. Construction.
      a. Time.
      b. Cost.
      c. By whom.
   4. Effects.
      a. commerce.
      b. International affairs.
      c. Water routes.

QUESTIONS.

Of what value will the completion of the Panama Canal be to the United States? To the world? What effect on commerce? On railways of the United States, and what class of railways?

In how many less days will a ship sail from New York to San Francisco on its completion?

What do we mean by the term "canalized"?

Why is it generally necessary for the government to take charge of the construction of canals?

Name some of the natural obstacles to be overcome in the construction of a canal.

When was the canal lock invented and what important changes did it lead to in the construction of canals?

How does the mileage of canals of the United States compare with that of other countries?

Give examples of canals for navigation and irrigation purposes respectively. Give names of canals designed for both purposes.

At what date was the construction of the Panama Canal undertaken? Under whose direction? What other canal had this engineer already constructed?

What led to the United States gaining control of this undertaking? At what date did the Panama Commission appointed by President Roosevelt begin active operations?

For how many centuries has the question of a canal across this isthmus been agitated? How does it compare as an undertaking with other canals? Why?

What great railroad president at one time secured concessions and took up the work of completing the canal? What did it cost him?

What practical problems does the Suez Canal solve? In what way is Great Britain especially benefited?

How will the completion of the Panama Canal affect Hawaii and the Philippine Islands?

What system of canals connects the Great Lakes and the Atlantic Ocean? What effect does this have on the commerce of the interior of the country?

What is the length of the Erie Canal and how does it compare in this respect with others?

What effect on the state of New York did the construction of this canal have? Under the supervision of what state was it constructed? What problems in commerce did it solve?

How does the freight traffic of the Sault Sainte Marie Canal compare with that of the Suez? How does it compare in length with that of the Erie?

What nation is said to be the originator of the present canal system of Europe?

What was primarily the purpose of the Chicago Drainage Canal? How is it regarded in the engineering world? How many years in construction? What other purpose does it serve than that of drainage?

Canals for irrigation originated in what country?

Irrigation in America was first practiced by what race?

How many acres of land have been reclaimed by irrigation in Egypt?

What is the United States Government doing along this line? What and how much territory will be reclaimed by the projects now under way? What is the value of same?

To what extent will the taxable property of the United States be increased?

I would urge upon every young man to obtain, by severest economy if necessary, a restricted, serviceable and steadily however slowly increasing series of books for use through life, making his little library, of all the furniture in his room, the most studied and decorative piece. —*John Ruskin.*

A common book will often give you much amusement, but it is only a noble book which will give you much profit. —*John Ruskin.*

Zoology

I. Definition.
II. Sub-Sciences.
  1. Systematic zoölogy.
  2. Distributional zoölogy.
  3. Animal morphology.
  4. Animal physiology.
  5. Ecologic zoölogy.
  6. Evolutionary zoölogy.
III. General Construction of Animals.
IV. Classification.
  1. Protozoa—One-celled animals.
    a. No definite shape; all forms; jelly-like substance; root-like projections of body for feet with which they seize their prey, and absorb it.
  2. Coelenterata—Many-celled.
    a. Simple organisms; capture food by long tentacles grouped around the mouth; no distinct circulatory system or body cavity; two types—free swimmers, shaped like a bell, and those cylindrical in form, fixed to some support.
    b. Examples: Sponge, anemone, coral, hydra, etc.
  3. Echinodermata.
    a. Sometimes called radiates. Consists of five parts around a center. Covering sometimes a hard shell; others, soft and leathery. Alimentary canal separate from body cavity.
    b. Three thousand living species found in all seas, such as starfish, sea urchin, crinoidea, etc.
  4. Vermes—Worms.
    a. Made up of joints or segments, head, tail, upper and lower surfaces, heart, nerves, etc.
    b. Many species, but all have same characteristics.
  5. Mollusca.
    a. Sometimes called shellfish. Possess alimentary canal, distinct nervous system, digestive apparatus, mouth, gullet, stomach, intestines; shell developed later in some.
    b. Examples: Oyster, clam, cuttlefish, etc.
  6. Arthropoda.
    a. Sometimes called articulates. Possess well organized nervous systems; usually have simple or compound eyes; some species are parasites.
    b. Examples: Insects, spiders, lobster, crab, etc.

7. Vertebrates.

a. Possess backbone; two cavities, upper containing brain, lower heart, digestive organs, etc.

b. Examples: Mammals, reptiles, fishes, birds, amphibians, etc.

CORRELATED SUBJECTS:

Genus	Nautilus	Snail	Sea urchin
Species	Birds	Amphibians	Foraminifera
Variety	Animals	Crinoida	Jellyfish
Fishes	Reptiles	Amoeba	Polyp
Crustacea	Mammalia	Vorticella	Oyster
Clam	Arachnida	Myriapoda	Mollusca

QUESTIONS.

NOTE.—For additional questions on animal life refer to NATURE STUDY. In that department will also be found interesting outlines on ANIMALS, BIRDS, FISH, INSECTS, etc.

What is zoölogy?

What is the derivation of the term zoölogy?

What does cold-blooded signify when applied to animals?

What are the difficulties of classification in the case of the lowest form of animal life?

What are the causes of the migratory habit of animals?

Which is the more abundant, the higher or lower forms of life? Why?

What animal is born without a covering? Why?

What are the most useful animals to man for domestic purposes?

What animals supply food and clothing to man?

What animals are known as ruminants?

What parts of the deer are of commercial value? Where are they found?

How are flesh-eating animals equipped to eat their food? To obtain it? They are satisfied with one meal at a time, eaten rapidly; why?

Why does live stock have to graze so continuously?

What is the difference between an animal and a plant?

Name some of the many ways in which nature has provided for the safety and preservation of wild animals?

What animals produce the most expensive furs?

What do you mean by vertebrates?

In general, what one part of wild animals is of commercial value?

Name the domestic animals in what you think the order of their usefulness.

It is not the reading of many books which is necessary to make a man wise and good, but the well-reading of a few, could he be sure to have the best.

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